

Medical Evaluation of Children When Abuse is Suspected

A Bibliography



June 2020

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Scope

The publications listed include books, chapters, journal articles, and other selected English language publications. International publications are included. The bibliography does not include theses and dissertations, audiovisual materials, or ephemera.

Organization

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Evaluation

Davis, A. L., Pecaric, M., Pusic, M. V., Smith, T., Shouldice, M., Brown, J., ... & Boutis, K. (2020). Deliberate practice as an educational method for learning to interpret the prepubescent female genital examination. *Child Abuse & Neglect, 101*, <https://doi.org/10.1016/j.chiabu.2020.104379>

Background: Correct interpretation of the prepubescent female genital examination is a critical skill; however, physician skill in this area is limited. Objective: To complement the bedside learning of this examination, we developed a learning platform for the visual diagnosis of the prepubescent female genital examination and examined the amount and rate of skill acquisition. Participants and Setting: Medical students, residents, and fellows and attendings participated in an on-line learning platform. Methods: This was a multicenter prospective cross-sectional study. Study participants deliberately practiced 158 prepubescent female genital examination cases hosted on a computer-based learning and assessment platform. Participants assigned the case normal or abnormal; if abnormal, they identified the location of the abnormality and the specific diagnosis. Participants received feedback after every case. Results: We enrolled 107 participants (26 students, 31 residents, 24 fellows and 26 attendings). Accuracy (95 % CI) increased by 10.3 % (7.8, 12.8), Cohen's d-effect size of 1.17 (1.14, 1.19). The change in specificity was +16.8 (14.1, 19.5) and sensitivity +2.4 (-0.9, 5.6). It took a mean (SD) 46.3 (32.2) minutes to complete cases. There was no difference between learner types with respect to initial (p=0.2) or final accuracy (p=0.4) scores. Conclusions: This study's learning intervention led to effective and feasible skill improvement. However, while participants improved significantly with normal cases, which has relevance in reducing unnecessary referrals to child protection teams, learning gains were not as evident in abnormal cases. All levels of learners demonstrated a similar performance, emphasizing the need for this education even among experienced clinicians.

Smith, T., Chauvin-Kimoff, L., Baird, B., & Ornstein, A. (2020). The medical evaluation of prepubertal children with suspected sexual abuse. *Paediatrics & Child Health, 25*(3), 180-186.

Child sexual abuse is an important and not uncommon problem. Children who have been sexually abused may present to a physician's office, urgent care centre, or emergency department for medical evaluation. A medical evaluation can provide reassurance to both child and caregiver, identify care needs, and offer an accurate interpretation of findings to the justice and child welfare systems involved. Given the potential medico-legal implications of these assessments, the performance of a comprehensive evaluation requires both current knowledge and clinical proficiency. This position statement presents an evidence-based, trauma-informed approach to the medical evaluation of prepubertal children with suspected or confirmed sexual abuse.

Taylor, M. A., & Higginbotham, J. C. (2020). Child sexual abuse exam results in West Alabama. *Journal of Child Sexual Abuse, 29*(1), 90-111.

Child sexual abuse (CSA) is a common problem, and allegations of CSA require a thorough multidisciplinary investigation which includes a comprehensive medical evaluation. Although most CSA victims will have normal exams, some will have physical injuries, sexually transmitted infections (STIs), and/or other problems. We are reporting the results of the examinations of 573 children evaluated in the West Alabama Child Medical Evaluation Program (WACMEP). This is the first report of CSA exams coming from Alabama and one of a few from a smaller medical center. Most were victimized by a single, older male perpetrator who was known to the family, often related, and had unsupervised access to the child. One-fourth (24.1%) of the children had significant exam findings, including 7.5% with a STI. Females were more likely to have significant findings including most of the STIs. Other historical factors statistically linked to an increased risk of having significant exam findings included being African-American, providing a clear history of abuse, and/or reporting vulvar pain or vaginal symptoms such as discharge, itching, or bleeding. The incidence of significant findings including STIs was similar to previously reported studies from larger urban centers across the United States, United Kingdom, and New Zealand.

Broaddus-Shea, E. T., Scott, K., Reijnders, M., & Amin, A. (2019). A review of the literature on good practice considerations for initial health system response to child and adolescent sexual abuse. *Child Abuse & Neglect*, <https://doi.org/10.1016/j.chiabu.2019.104225>

Background: Healthcare workers play an important role in responding to the needs of the millions of children and adolescents who experience sexual abuse around the globe. A supportive child and adolescent-centered initial response is crucial for the physical and emotional wellbeing of survivors. **Objective:** In 2017, the World Health Organization (WHO) published clinical guidelines for responding to child and adolescent sexual abuse. The review described in this paper informed the development of good practice statements on how best to deliver health care to survivors. **Participants and setting:** This review examined the values and preferences of children and adolescents who were sexually abused, and of their caregivers and healthcare workers, regarding: 1) initial response to children and adolescents who have been sexually abused; and 2) obtaining medical history, conducting physical examination, and documenting examination findings. **Methods:** Searches were conducted in Scopus, Pubmed, and the WHO's Global Index Medicus (1 January, 1995-15 July 2016). All articles in English that indicated preferences of survivors, included. **Results:** Sixty-two articles were included and analyzed thematically. Key findings included the importance of providing care to survivors in a manner that respects the child or adolescent's autonomy and wishes, ensures privacy and confidentiality, and makes services and facilities appropriate and welcoming. **Conclusions:** Findings indicate how evidence-based recommendations can be delivered in a child or adolescent-centred and trauma-informed manner.

Cleek, E. A., Johnson, N. L., & Sheets, L. K. (2019). Interdisciplinary collaboration needed in obtaining high-quality medical information in child abuse investigations. *Child Abuse & Neglect*, 92, 167-178.

Background: Despite reporting legislation, healthcare providers (HCPs) do not always report and collaborate in cases of suspected child abuse. Recognizing this leaves children at risk, the Wisconsin Child Abuse Network (WI CAN) sought to understand barriers to mandated reporting and collaboration with child abuse investigators. **Objective:** The purpose of the study was to investigate barriers for professionals in providing and obtaining high-quality medical information in child abuse investigations. **Participants and setting:** Participants included five discipline-specific focus groups: HCPs, child protective services (CPS), law enforcement, lawyers, and judges. All

professionals had been directly involved in Wisconsin child abuse cases. Methods: This qualitative study consisted of discipline-specific focus groups, directed by open-ended interview questions. Data analysis was completed through the narrative inquiry methodology. Results: Barriers to providing and obtaining high-quality medical information in child abuse investigations were both discipline-specific and universal amongst all groups. Discipline-specific barriers included: HCPs' discomfort with uncertainty; CPS' perception of disrespect and mistrust by HCPs; law enforcement's concerns with HCPs' overstepping professional boundaries; lawyers' concern of HCPs' discomfort with court proceedings; and judges' perception of a lack of understanding between all disciplines. Universal barriers included: value of high-quality medical information in child abuse investigations, burden of time and money; unequal resources between counties; a need for protocols, and a need for interdisciplinary collaboration. Conclusion: Findings from this study suggest several ways to address identified barriers. Possible interventions include equalizing resources between urban and rural counties (specifically financial resources and access to child abuse experts); protocolizing reporting and investigations; and, increasing interprofessional education.

Dargan, S., Daigneault, I., Ovetchkine, P., Jud, A., & Frappier, J. Y. (2019). Association between child sexual abuse and infectious disease diagnoses. *Child Abuse & Neglect*, 97, <https://doi.org/10.1016/j.chiabu.2019.104142>

Background: Though many studies have linked child sexual abuse (CSA) to psychological health problems, little is known regarding the relationship between CSA and children and adolescents' physical health. Objective: The objective of this study was to assess the relationship between CSA and infectious disease diagnoses. Participants: Of the 955 eligible children and adolescents who had a substantiated report of sexual abuse between 2001 and 2010, medical data was retrieved for 882 individuals, who formed the sexually abused group. These 882 participants were matched to 882 participants on age, gender, and administrative healthcare region to form the general population group. Setting and methods: This matched-cohort study, conducted in a large Canadian city, compared the number of infectious disease diagnoses between the date of the substantiated sexual abuse report and August 1, 2013, between the two groups. Results: Results indicate that sexually abused participants had 1.27 times more (95% CI – 1.13 to 1.42) infectious diseases diagnoses than those from the general population. They received 1.83 times more genitourinary

infection diagnoses (95% CI – 1.43 to 2.33), 1.31 times more diagnoses for other types of infections (95% CI – 1.11 to 1.55) and 1.21 times more respiratory and ear infection diagnoses (95% CI – 1.05 to 1.40). There was no statistically significant difference regarding skin infection diagnoses. These results indicate an association between CSA and more frequent infectious diseases diagnoses.

Finkel, M. A. (2019). Experience and reason: A US clinician's perspective of an approach to meeting the diagnostic and therapeutic needs of children suspected of being sexually abused. *Child Abuse Review*, 28(2), 98-105.

This paper reflects an approach to the medical evaluation of children alleged to have been sexually abused to meet their diagnostic and therapeutic needs. The approach emphasises the importance of the role of the doctor in conducting thorough medical into the formulation of a balanced and objective opinion. © 2019 John Wiley & Sons, Ltd.

Adams, J. A. (2018). [Understanding medical findings in child sexual abuse: An update for 2018.](#) *Academic Forensic Pathology*, 8(4), 924-937.

When child sexual abuse is suspected, it is important for medical professionals to understand normal as well as abnormal features of the external genital and anal tissues in children. Physicians and other healthcare professionals who rarely perform a detailed examination of these areas may mistakenly interpret normal findings, or findings caused by conditions unrelated to abuse, as signs of injury due to sexual abuse. For this reason, it is important for all medical professionals to have a basic understanding of the appearance of the genital and anal tissues in children. Examples of normal and abnormal genital and anal findings are provided via annotated images. This review presents a research-based summary of how medical findings in children should be interpreted with respect to possible sexual abuse. Resources for obtaining expert review of medical findings are described.

Adams, J. A., Farst, K. J., & Kellogg, N. D. (2018). Interpretation of medical findings in suspected child sexual abuse: an update for 2018. *Journal of Pediatric and Adolescent Gynecology*, 31(3), 225-231.

Most sexually abused children will not have signs of genital or anal injury, especially when examined nonacutely. A recent study reported that only 2.2% (26 of 1160) of sexually abused girls examined nonacutely had diagnostic physical findings, whereas among those examined acutely, the prevalence of injuries was 21.4% (73 of 340). It is important for health care professionals who examine children who might have been sexually abused to be able to recognize and interpret any physical signs or laboratory results that might be found. In this review we summarize new data and recommendations concerning documentation of medical examinations, testing for sexually transmitted infections, interpretation of lesions caused by human papillomavirus and herpes simplex virus in children, and interpretation of physical examination findings. Updates to a table listing an approach to the interpretation of medical findings is presented, and reasons for changes are discussed.

Alexander, R. (2017). Medical evaluations then and now. *Journal of Interpersonal Violence*, 32(6), 826-852.

The role of medicine for children suspected of having been sexually abused has advanced significantly since the 1980s. Newer tests such as DNA and nucleic acid amplification have added to the detection of perpetrators and disease, respectively. Non-acute examination physical findings are seen in only 5% to 10% of instances. Physical findings regarding the hymen and anus have been found to often be normal variants—findings that some used to regard as signs of sexual abuse. Newer considerations for clinicians include Internet child pornography, human trafficking, and use of video/photographic recording. New technologies such as high definition digital photography and telemedicine help to document abuse in a much improved way than existed several decades ago. Nevertheless, the basic approach of careful history taking remains a bedrock for the diagnosis of child sexual abuse.

McIntosh, N., & Mok, J. Y. (2017). A comparison of accidental and abusive ano-genital injury in children. *Child Abuse Review*, 26(3), 230-244.

Three two-year datasets of ano-genital signs were collected for comparisons of the injuries seen with accidental trauma and child sexual abuse in children less than 16 years of age: (1) Those attending a regional children's emergency department (South East Scotland) (n = 146) for injuries to the ano-genital area; (2) all admissions to hospital in Scotland for straddle injury (n = 56); and (3) all children attending a regional child abuse and neglect service for assessment of suspected child sexual abuse (n = 98). Accidental injury types were combined for comparison with abusive injuries. In South East Scotland, 1:1785 children under 16 years will attend an emergency department and 1:9305 will be admitted annually for an ano-genital injury. In boys, penile and scrotal injuries were only seen following accidents; anal injury was more frequent following suspected abuse (36%) than after accidents (5%). In girls, injuries to the perineum and labia were more frequent after accidental trauma (32% and 74%, respectively, compared to 2% and 11% following suspected abuse), while hymenal injuries were more frequent after sexual abuse (19% compared to 1% in the accident group). Acute injuries to the posterior fourchette were common from both causes, (17% accidents and 10% abuse) and vaginal injuries were uncommon in both groups (5% accidents and 2% abuse). The sites of injury may assist in the differential diagnosis of the cause in ano-genital injuries. Copyright © 2017 John Wiley & Sons, Ltd

Morris, M., Rivaux, S., & Faulkner, M. (2017). Provider ambivalence about using forensic medical evaluation to respond to child abuse: A content and discourse analysis. *Child Abuse & Neglect*, 65, 140-151.

Forensic medical evaluation rates for child abuse victims in Texas are low relative to national rates. In exploring reasons, researchers collected quantitative and qualitative interview and focus group data from multidisciplinary child abuse response team members across the state. This paper presents results of a secondary analysis of (N = 19) health care providers' interview and focus group transcripts, looking specifically at experiences with conducting forensic evaluations – thoughts, struggles, and ethical issues. The analysis was conducted from a critical realist perspective using content and discourse analysis. A theme of ambivalence was identified and explored. Three discursive themes were identified: ambivalence about the legal role, the health care role, and about unintended outcomes of evaluations. Extra-discursive elements related to the

physical body, resource distribution, and funding policy were examined for their interaction with discursive patterns. Implications of findings include addressing issues in the current approach to responding to child abuse (e.g., uniting around common definitions of abuse; refining parameters for when FME is helpful; shoring up material resources for the abuse response infrastructure) and considering modification of providers' roles and activities relative to forensic work (e.g., deploying providers for prevention activities versus reactive activities).© 2017 Elsevier Ltd. All rights reserved.

Schilling, S., Deutsch, S. A., Gieseke, R., Molnar, J., Lavelle, J. M., & Scribano, P. V. (2017). Improving HIV post-exposure prophylaxis rates after pediatric acute sexual assault. *Child Abuse & Neglect*, 69, 106-115.

The purpose of our study was to increase the rate of children with appropriate HIV-PEP regimens among those diagnosed with sexual assault in The Children's Hospital of Philadelphia Emergency Department (ED). The outcome measure was the percent of patients receiving correct HIV-PEP. We retrospectively reviewed 97 charts over 31 months to define the baseline rate of children receiving appropriate HIV-PEP regimens (pre QI-implementation period: 2/2012–8/2014). Among children in which HIV-PEP was indicated following sexual assault, 40% received the recommended 28-day course. Root cause analysis indicated prescribing errors accounted for 87% of patients not receiving appropriate HIV-PEP. Process drivers included standardizing care coordination follow-up calls to elicit specific information about HIV-PEP, ED educational initiatives targeted at HIV-PEP prescribing, revision of the clinical pathway to specify indicated duration of HIV-PEP, and revision of the order set to auto-populate the number of days for the HIV-PEP prescription. During the QI-implementation period (9/2014–4/2015), the rate of appropriate HIV-PEP increased to 64% (median 60%) and the average number of days between incorrect HIV-PEP regimens was 24.5. Post QI-implementation (5/2015–3/2016), the rate of appropriate HIV-PEP increased to 84% (median 100%) and the average number of days between incorrect HIV-PEP regimens increased to 78.4. A multifaceted quality improvement process improved the rate of receipt of appropriate HIV-PEP regimens for pediatric victims of sexual assault. Decision support tools are instrumental in sustaining ideal care delivery, but require ongoing evaluation and improvement in order to remain optimally effective.

Wheeler, K. K., Shi, J., Xiang, H., Haley, K. J., & Groner, J. I. (2017). Child maltreatment in US emergency departments: Imaging and admissions. *Child Abuse & Neglect*, 69, 96-105.

We report imaging and admission ratios for children with definitive and suggestive maltreatment in a national sample of emergency departments (EDs). Using the 2012 Nationwide Emergency Department Sample (NEDS), we generated national estimates of ED visits for children <10 years with both definitive and suggestive maltreatment. Outcomes were admission/transfer ratios for children <10 years and screening ratios by skeletal surveys and head computed tomography (CT) for children <2 years with suspected physical abuse. We compared hospitals with low, medium, and high pediatric ED volumes using multivariable logistic regression. The 2012 national estimate of U.S. ED visits (children <10 years) with definitive maltreatment is 14,457 (95% CI: 11,987–16,928). Suggestive child maltreatment was seen in an additional 103,392 (95% CI: 90,803–115,981) pediatric ED visits. After controlling for patient case mix, high volume hospitals had a significantly higher adjusted odds ratio (AOR) of admission/transfer among definitive cases (AOR =1.74, 95% CI: 1.08–2.81), and medium volume hospitals had a higher odds of admission/transfer among suggestive cases (AOR =1.24, 95% CI: 1.02–1.50) when compared with low volume hospitals. In hospitals with reliable reporting of imaging procedures, high volume hospitals reported skeletal surveys (age <2 years) significantly more often than low volume hospitals, AOR =3.32 (95% CI: 1.25–8.84); the AORs for head CT did not differ by hospital volume. Low volume hospitals were less likely to screen by skeletal survey, but head CT ratios were not affected by ED volume. Low volume hospitals were also less likely to admit or transfer.

Adams, J. A., Kellogg, N. D., Farst, K. J., Harper, N. S., Palusci, V. J., Frasier, L. D., ... & Starling, S. P. (2016). [Updated guidelines for the medical assessment and care of children who may have been sexually abused](#). *Journal of Pediatric and Adolescent Gynecology*, 29(2), 81-87.

The medical evaluation is an important part of the clinical and legal process when child sexual abuse is suspected. Practitioners who examine children need to be up to date on current recommendations regarding when, how, and by whom these evaluations should be conducted, as well as how the medical findings should be interpreted. A previously published article on guidelines for medical care for sexually abused children has been widely used by physicians, nurses, and nurse practitioners to inform practice guidelines in this field. Since 2007, when the

article was published, new research has suggested changes in some of the guidelines and in the table that lists medical and laboratory findings in children evaluated for suspected sexual abuse and suggests how these findings should be interpreted with respect to sexual abuse. A group of specialists in child abuse pediatrics met in person and via online communication from 2011 through 2014 to review published research as well as recommendations from the Centers for Disease Control and Prevention and the American Academy of Pediatrics and to reach consensus on if and how the guidelines and approach to interpretation table should be updated. The revisions are based, when possible, on data from well-designed, unbiased studies published in high-ranking, peer-reviewed, scientific journals that were reviewed and vetted by the authors. When such studies were not available, recommendations were based on expert consensus.

Killough, E., Spector, L., Moffatt, M., Wiebe, J., Nielsen-Parker, M., & Anderst, J. (2016). Diagnostic agreement when comparing still and video imaging for the medical evaluation of child sexual abuse. *Child Abuse & Neglect*, 52, 102-109.

Still photo imaging is often used in medical evaluations of child sexual abuse (CSA) but video imaging may be superior. We aimed to compare still images to videos with respect to diagnostic agreement regarding hymenal deep notches and transections in post-pubertal females. Additionally, we evaluated the role of experience and expertise on agreement. We hypothesized that videos would result in improved diagnostic agreement of multiple evaluators as compared to still photos. This was a prospective quasi-experimental study using imaging modality as the quasi-independent variable. The dependent variable was diagnostic agreement of participants regarding presence/absence of findings indicating penetrative trauma on non-acute post-pubertal genital exams. Participants were medical personnel who regularly perform CSA exams. Diagnostic agreement was evaluated utilizing a retrospective selection of videos and still photos obtained directly from the videos. Videos and still photos were embedded into an on-line survey as sixteen cases. One-hundred sixteen participants completed the study. Participant diagnosis was more likely to agree with study center diagnosis when using video ($p < 0.01$). Use of video resulted in statistically significant changes in diagnosis in four of eight cases. In two cases, the diagnosis of the majority of participants changed from no hymenal transection to transection present. No difference in agreement was found based on experience or expertise. Use of video vs. still images resulted in increased agreement with original examiner and changes in diagnostic impressions in

review of CSA exams. Further study is warranted, as video imaging may have significant impacts on diagnosis. © 2015 Elsevier Ltd. All rights reserved.

Melville, J. D., Kellogg, N. D., Perez, N., & Lukefahr, J. L. (2014). Assessment for self-blame and trauma symptoms during the medical evaluation of suspected sexual abuse. *Child Abuse & Neglect*, 38(5), 851-857.

The purpose of this study was to describe behavioural and emotional symptoms and to examine the effect of abuse-related factors, family responses to disclosure, and child self-blame on these symptoms in children presenting for medical evaluations after disclosure of sexual abuse. A retrospective review was conducted of 501 children ages 8–17. Trauma symptoms were determined by two sets of qualitative measures. Abstracted data included gender, ethnicity, and age; severity of abuse and abuser relationship to child; child responses regarding difficulty with sleep, school, appetite/weight, sadness, or self-harm, parent belief in abuse disclosure, and abuse-specific self-blame; responses to the Trauma Symptom Checklist in Children-Alternate; and the parent's degree of belief in the child's sexual abuse disclosure. Overall, 83% of the children had at least one trauma symptom; 60% had difficulty sleeping and one-third had thoughts of self-harm. Child age and abuse severity were associated with 3 of 12 trauma symptoms, and abuse-specific self-blame was associated with 10 trauma symptoms, after controlling for other variables. The children of parents who did not completely believe the initial disclosure of abuse were twice as likely to endorse self-blame as children of parents who completely believed the initial disclosure. Screening for behavioural and emotional problems during the medical assessment of suspected sexual abuse should include assessment of self-blame and family responses to the child's disclosures. In addition, parents should be informed of the importance of believing their child during the initial disclosure of abuse and of the impact this has on the child's emotional response to the abuse.

Miller, A. J., & Barlup Toombs, K. (2014). Educating physicians internationally in the diagnosis of child sexual abuse: Evaluation of a brief educational intervention in Malawi. *Journal of Child Sexual Abuse*, 23(3), 247-255.

We designed this pilot study to assess physician knowledge and comfort evaluating child sexual abuse in Malawi and to evaluate the feasibility of a brief educational intervention to improve physician knowledge. A survey was administered to 21 physicians before receiving training on child sexual abuse. The survey was administered again, 3 days later, to assess improvement. Prior to the training, 48% correctly identified the hymen in a photograph, and 24% correctly interpreted the photograph as normal. Of the 11 physicians available for the posttest 3 days later, significant improvement was found in their ability to correctly identify the hymen (6 of 11 pretraining and all 11 posttraining, $p = 0.011$) and to interpret the photograph correctly (1 of 11 correct pretraining, 9 of 11 posttraining, $p = 0.001$). This study demonstrates the feasibility of designing trainings on child sexual abuse in a low-income country.

American Professional Society on the Abuse of Children. (2013). *APSAC Advisor*. Special edition on medical services. 25(1/2).

Jenny, C., Crawford-Jakubiak, J. E., Christian, C. W., Flaherty, E. G., Leventhal, J. M., Lukefahr, J. L., & Sege, R. D. (2013). [The evaluation of children in the primary care setting when sexual abuse is suspected](#). *Pediatrics*, 132(2), e558-e567.

This clinical report updates a 2005 report from the American Academy of Pediatrics on the evaluation of sexual abuse in children. The medical assessment of suspected child sexual abuse should include obtaining a history, performing a physical examination, and obtaining appropriate laboratory tests. The role of the physician includes determining the need to report suspected sexual abuse; assessing the physical, emotional, and behavioral consequences of sexual abuse; providing information to parents about how to support their child; and coordinating with other professionals to provide comprehensive treatment and follow-up of children exposed to child sexual abuse.

Leder, M. R., Leber, A. L., Marcon, M. J., & Scribano, P. V. (2013). Use of APTIMA Combo 2: The experience of a child advocacy center. *Journal of Child Sexual Abuse, 22*(3), 297-311.

The Centers for Disease Control and Prevention recommends nucleic acid amplification testing for chlamydia and gonorrhea in sexually abused girls. No studies describe performance of APTIMA Combo 2 Assay with second target confirmation on the same testing platform. This nucleic acid amplification testing is evaluated within a large child advocacy center. Girls 3 to 18 years, 35% of whom reported consensual sexual activity, were prospectively tested by APTIMA Combo 2 on urine/vaginal swabs and by vaginal culture. A case of infection was defined as positive culture or positive urine or vaginal swab nucleic acid amplification testing with second target confirmation. Sensitivity of APTIMA Combo 2 on urine was found to be superior to vaginal culture and comparable to APTIMA Combo 2 on vaginal swabs for both infections. APTIMA Combo 2 on urine is less invasive, and its use may be preferred in this traumatized population.

Myhre, A. K., Adams, J. A., Kaufhold, M., Davis, J. L., Suresh, P., & Kuelbs, C. L. (2013). Anal findings in children with and without probable anal penetration: A retrospective study of 1115 children referred for suspected sexual abuse. *Child Abuse & Neglect, 37*(7), 465-474.

Interpreting the significance of anal findings in child sexual abuse can be difficult. The aim of this study is to compare the frequency of anal features between children with and without anal penetration. This is a retrospective blinded review of consecutive charts of children seen for suspected sexual abuse at a regional referral center from January 1, 2005 to December 31, 2009. Based on predetermined criteria, children were classified into two groups: low or high probability of anal penetration. The charts of 1115 children were included, 84% girls and 16% boys with an age range from 0.17 to 18.83 years (mean 9.20 year). 198 children (17.8%) were classified as belonging to the anal penetration group. Bivariate analysis showed a significant positive association between the following features and anal penetration: Anal soiling ($p=0.046$), fissure ($p=0.000$), laceration ($p=0.000$) and total anal dilatation ($p=0.000$). Logistic regression analysis and stratification analysis confirmed a positive association of soiling, anal lacerations and anal fissures with anal penetration. Total anal dilation was significantly correlated with a history of anal penetration in girls, in children examined in the prone knee chest position and in children without anal symptoms. Several variables were found to be significantly associated with anal penetration,

including the controversial finding of total anal dilatation. Due to limitations in the study design, this finding should still be interpreted with caution in the absence of a clear disclosure from the child.

Price, J. (2013). Injuries in prepubertal and pubertal girls. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 27(1), 131-139.

In this chapter, examination techniques are first recommended, and then terminology for genital injuries that may occur after child sexual abuse or rape (e.g. lacerations, notch, transaction) are described. Current evidence for these injuries is provided. Areas of controversy (e.g. hymenal diameter, hymenal width) are described and completed with cautionary notes on inflammation, bruising, abrasions, bumps and mounds, tags, labial fusion, lichen sclerosis). The chapter concludes with a debate on normal findings that are reported to occur in up to 99% of children referred for examination. © 2012 Published by Elsevier Ltd.

Rheingold, A. A., Davidson, T. M., Resnick, H., Self-Brown, S., & Danielson, C. K. (2013). The relationship between knowledge and child and caregiver distress during the medical examination for child sexual abuse. *Journal of Child Sexual Abuse*, 22(5), 552-571.

When child sexual abuse is suspected, a child sexual abuse–related medical examination is recommended to ensure the child's well-being. While the extant research has sought to identify factors influencing child distress during this examination, only recently have studies began examining variables that may be directly associated with the child or with the medical setting. Knowledge of the child sexual abuse–related medical examination is one medical-related variable that has been implicated in child and caregiver distress during the examination. The current study contributes to the existing literature by investigating associations among examination knowledge in relation to caregiver and child anxiety at the time of a child sexual abuse–related medical examination, taking into account ethnicity, past child abuse, injury to child as result of abuse, and caregiver response to disclosure. Sixty-eight children and their nonoffending caregiver were assessed. Results indicated that understanding of the examination and caregiver response to disclosure were significantly associated with caregiver and child anxiety.

Shaw, J., & Campbell, R. (2013). Predicting sexual assault kit submission among adolescent rape cases treated in forensic nurse examiner programs. *Journal of Interpersonal Violence, 28*(18), 3400-3417.

Following a sexual assault, victims are usually advised to have a medical forensic exam and sexual assault forensic exam kit (SAK). Once completed, the SAK is to be transported by law enforcement to the crime lab for analysis. However, many kits are never transported to the crime lab, thereby preventing forensic evidence obtained in the kit to be used during the prosecutorial process. The current study examined rates of SAK submission for 393 adolescent sexual assault cases in two Midwestern communities and explored what factors predicted law enforcement officers' submission of SAKs to the crime lab for analysis. Findings reveal that more than 40% of the adolescent cases did not have their SAK submitted, and several factors, including the age and race of the victim, the number of perpetrators in the assault, and the number of assaultive acts, predicted SAK submission. Implications for SAK community protocols are discussed.

Starling, S. P., Frasier, L. D., Jarvis, K., & McDonald, A. (2013). Inter-rater reliability in child sexual abuse diagnosis among expert reviewers. *Child Abuse & Neglect, 37*(7), 456-464.

Objectives were to determine how well experts agree when assessing child sexual abuse cases.

A total of twelve physician subjects were recruited and voluntarily enrolled from an existing peer review network. Experts from the network had been chosen for their experience in the field and their affiliation with children's advocacy centers. Each expert submitted three cases of prepubertal female genital examinations clearly demonstrable of the case findings. Submitted cases included demographics, history, physical and genital exam findings, photodocumentation, and diagnosis. Experts reviewed each submitted case and labeled the case negative for physical finding(s), positive for physical finding(s), or indeterminate. Cases were analyzed to determine the level of agreement. Thirty-six cases were submitted for use in this study; one case was excluded prior to starting the review process. After all experts completed their reviews the authors reviewed the cases and results. Two additional cases were excluded, one due to poor quality photodocumentation and one for not meeting the study criteria. Thirty-three cases were used for data analysis. All 12 expert reviewers agreed in 15 of the cases. Overall, in 22 of 33 (67%) cases at least 11 of the 12 reviewers agreed with the original diagnosis. Six of 33 (18%) cases had variable agreement (8–10 reviewers agreed with original diagnosis) among reviewers; 5 of 33

(15%) cases had poor or mixed agreement (7 or less reviewers agreed with original diagnosis). Experts exhibit consensus in cases where the findings clearly are normal and abnormal, but demonstrate much more variability in cases where the diagnostic decisions are less obvious. Most of the diagnostic variability is due to interpretation of the findings as normal, abnormal or indeterminate, not on the perception of the examination findings themselves. More research should be done to develop a national consensus on the accurate interpretation of anogenital examination findings. Photographic image quality plays an important role in this quality review process and universally needs to be improved.

Trübner, K., Schubries, M., Beintker, M., & Bajanowski, T. (2013). Genital findings in boys suspected for sexual abuse. *International Journal of Legal Medicine*, 127(5), 967-970.

Injuries in the genital region of boys are mostly caused by accidents. In this study, three cases of child abuse and one case suspicious for child abuse but explainable by a congenital undiscovered malformation are presented. Injuries or findings in the genital region are especially suspicious for child abuse, including sexual abuse. Because of the possible misinterpretation and the consequences of a false confirmation of a child abuse, an interdisciplinary cooperation between pediatrics, forensic experts, and pediatric urologist should be carried out in doubtful cases.

Adams, J. A., Starling, S. P., Frazier, L. D., Palusci, V. J., Shapiro, R. A., Finkel, M. A., & Botash, A. S. (2012). Diagnostic accuracy in child sexual abuse medical evaluation: Role of experience, training, and expert case review. *Child Abuse & Neglect*, 36(5), 383-392.

The purpose of this study was to assess the ability of clinicians who examine children for suspected sexual abuse to recognize and interpret normal and abnormal ano-genital findings in magnified photographs using an online survey format. (2) Determine which factors in education, clinical practice, and case review correlate with correct responses to the survey questions. Between July and December 2007, medical professionals participated in a web-based survey. Participants answered questions regarding their professional background, education, clinical experience, and participation in case review. After viewing photographs and clinical information from 20 cases, participants answered 41 questions regarding diagnosis and medical knowledge. Answers chosen by an expert panel were used as the correct answers for the survey. The mean number of correct answers among the 141 first-time survey respondents was 31.6 (SD 5.9, range 15–41). Child Abuse

Pediatricians (CAP) had mean total scores which were significantly higher than Pediatricians (Ped) (34.8 vs. 30.1, $p < 0.05$) and Sexual Assault Nurse Examiners (SANE) (34.8 vs. 29.3, $p < 0.05$). The mean total scores for Ped, SANE, and Advanced Practice Nurses (APN) who examine fewer than 5 children monthly for possible CSA were all below 30. Total score was directly correlated with the number of examinations performed monthly ($p = 0.003$). In multivariable regression analysis, higher total score was associated with self-identification as a CAP, reading The Quarterly Update newsletter ($p < 0.0001$), and with quarterly or more frequent expert case reviews using photo-documentation ($p = 0.0008$). Child Abuse Pediatricians, examiners who perform many CSA examinations on a regular basis, examiners who regularly review cases with an expert, and examiners who keep up to date with current research have higher total scores in this survey, suggesting greater knowledge and competence in interpreting medical and laboratory findings in children with CSA. Review of cases with an expert in CSA medical evaluation and staying up to date with the CSA literature are encouraged for non-specialist clinicians who examine fewer than 5 children monthly for suspected sexual abuse.

Bajaj, M. (2012). Vesicular genital lesions in a toddler— is it sexual abuse?. *Child Abuse Review, 21*(5), 370-373.

All professionals should be alert to potential indicators of child abuse. However, a thorough history and examination to rule out common medical conditions/childhood illnesses should be undertaken prior to referral to social care or paediatricians for a child protection assessment. Failure to do so can result in unnecessary anger and distress for parents due to the stigma attached to child abuse. This case illustrates how common childhood illnesses can present with findings suggestive of sexual abuse.

Fong, H. F., & Christian, C. W. (2012). Evaluating sexually transmitted infections in sexually abused children: New techniques to identify old infections. *Clinical Pediatric Emergency Medicine, 13*(3), 202-212.

Testing for sexually transmitted infections (STIs) is an important component of the medical evaluation for sexually abused children. Selective screening of this population with culture or microscopy-based techniques has been the traditional approach, particularly in younger children who have a lower prevalence of STIs compared with adolescents. However, newer testing

methodologies (nucleic acid amplification tests) that use noninvasively collected specimens enable more widespread screening in children. This article provides an updated review of recommended STI testing and interpretation in children who present with suspected sexual abuse, focusing on these emerging methodologies and the evidence to support their use.

Gavril, A. R., Kellogg, N. D., & Nair, P. (2012). [Value of follow-up examinations of children and adolescents evaluated for sexual abuse and assault](#). *Pediatrics*, 129(2), 282-289.

Honor, G., Thackeray, J., Scribano, P., Curran, S., & Benzinger, E. (2012). Pediatric sexual assault nurse examiner care: Trace forensic evidence, ano-genital injury, and judicial outcomes. *Journal of Forensic Nursing*, 8(3), 105-111.

Although pediatric sexual assault nurse examiners (P-SANEs) have been providing care for over two decades there remain major gaps in the literature describing the quality of P-SANE care and legal outcomes associated with their cases. The purpose of this study was to compare quality indicators of care in a pediatric emergency department (PED) before and after the implementation of a P-SANE program described in terms of trace forensic evidence yield, identification of perpetrator DNA, and judicial outcomes in pediatric acute sexual assault. A retrospective review of medical and legal records of all patients presenting to the PED at Nationwide Children's Hospital with concerns of acute sexual abuse/assault requiring forensic evidence collection from 1/1/04 to 12/31/07 was conducted. Detection and documentation of ano-genital injury, evaluation and documentation of pregnancy status, and testing for *N. gonorrhoea* and *C. trachomatis* was significantly improved since implementation of the P-SANE Program compared to the historical control. The addition of a P-SANE to the emergency department (ED) provider team improved the quality of care to child/adolescent victims of acute sexual abuse/assault.

Leder, M. R. (2012). Acute sexual assault and evidence collection in the DNA era. *Clinical Pediatric Emergency Medicine*, 13(3), 194-201.

Approximately 70 000 reports of sexual abuse in children and adolescents are substantiated each year. Many of these cases present to the emergency department for assessment. Knowledge of which cases require emergent evaluation is essential. This article will provide a description of the steps in the assessment of acute sexual assault in children and adolescents including components

of the patient interview, proper interpretation of physical examination findings, indications for sexually transmitted infection screening, and prophylaxis as well as forensic evidence collection, assessment of a drug-facilitated sexual assault, and when a report to child protective services and law enforcement is appropriate. A case of acute sexual assault will be used to illustrate pertinent points.

Louwers, E. C., Korfage, I. J., Affourtit, M. J., Scheewe, D. J., van de Merwe, M. H., Vooijs-Moulaert, A. F. S., ... & de Koning, H. J. (2012). [Effects of systematic screening and detection of child abuse in emergency departments.](#) *Pediatrics*, *130*(3), 457-464.

Although systematic screening for child abuse of children presenting at emergency departments might increase the detection rate, studies to support this are scarce. This study investigates whether introducing screening, and training of emergency department nurses, increases the detection rate of child abuse. In an intervention cohort study, children aged 0 to 18 years visiting the emergency departments of 7 hospitals between February 2008 and December 2009 were enrolled. We developed a screening checklist for child abuse (the “Escape Form”) and training sessions for nurses; these were implemented by using an interrupted time-series design. Cases of suspected child abuse were determined by an expert panel using predefined criteria. The effect of the interventions on the screening rate for child abuse was calculated by interrupted time-series analyses and by the odds ratios for detection of child abuse in screened children. A total of 104 028 children aged 18 years or younger were included. The screening rate increased from 20% in February 2008 to 67% in December 2009. Significant trend changes were observed after training the nurses and after the legal requirement of screening by the Dutch Health Care Inspectorate in 2009. The detection rate in children screened for child abuse was 5 times higher than that in children not screened (0.5% vs 0.1%, $P < .001$). These results indicate that systematic screening for child abuse in emergency departments is effective in increasing the detection of suspected child abuse. Both a legal requirement and staff training are recommended to significantly increase the extent of screening.

Adams, J. S. (2011). Medical evaluation of suspected child sexual abuse: 2011 update. *Journal of Child Sexual Abuse, 20*(5), 588-605.

Berkowitz, C. D. (2011). Healing of genital injuries. *Journal of Child Sexual Abuse, 20*(5), 537-547.

Child sexual abuse as well as accidental trauma may cause acute injuries in the anogenital area. Most data on residual findings following genital trauma come from longitudinal studies of children who have been sexually assaulted, undergone surgical procedures, or experienced accidental trauma. Like injuries in other parts of the body, such injuries undergo a predictable pattern of healing. Most superficial injuries heal without any residual evidence. Deeper injuries, as well as those that become infected or experience repeated disruption, may produce permanent changes. While the presence of such changes supports allegations of prior anogenital trauma, their absence does not preclude the trauma from having occurred.

Finkel, M. A., & Alexander, R. A. (2011). Conducting the medical history. *Journal of Child Sexual Abuse, 20*(5), 486-504.

Girardet, R., Bolton, K., Lahoti, S., Mowbray, H., Giardino, A., Isaac, R., ... & Paes, N. (2011). [Collection of forensic evidence from pediatric victims of sexual assault](#). *Pediatrics, 128*(2), 233-238.

To determine the time period after sexual assault of a child that specimens may yield evidence using DNA amplification. Secondary questions included the comparative laboratory yields of body swabs versus other specimens, and the correlation between physical findings and laboratory results. Data from evidence-collection kits from children 13 years and younger were reviewed. Kits were screened for evidence using traditional methods, and DNA testing was performed for positive specimens. Laboratory data were compared with historical information. There were 277 evidence-collection kits analyzed; 151 were collected from children younger than 10; 222 kits (80%) had 1 or more positive laboratory screening test, of which 56 (20%) tested positive by DNA. The time interval to collection was <_24 hours for 30 of the 56 positive kits (68% positives with a documented time interval), and 24 (43% of all positive kits) were positive only by nonbody specimens. The majority of children with DNA were aged 10 or older, but kits from 14 children

younger than 10 also had a positive DNA result, of which 5 were positive by a body swab collected between 7 and 95 hours after assault. Although body swabs were important sources of evidence for older children, they were significantly less likely than nonbody specimens to yield DNA among children younger than 10 ($P = .002$). There was no correlation between physical findings and laboratory evidence. Body samples should be considered for children beyond 24 hours after assault, although the yield is limited. Physical examination findings do not predict yield of forensic laboratory tests.

Honor, G. (2011). Medical evaluation for child sexual abuse: What the PNP needs to know. *Journal of Pediatric Health Care*, 25(4), 250-256.

Sexual abuse is a problem of epidemic proportions. Pediatric nurse practitioners (PNPs) will most likely encounter sexually abused children in their practice, both those who have been previously diagnosed and others who are undiagnosed and require identification by the PNP. This continuing education article will discuss the medical evaluation of children with concerns of suspected sexual abuse. Acute and non-acute sexual abuse/assault examinations will be discussed. Physical findings and sexually transmitted infections concerning for sexual abuse/assault will also be discussed.

Spivey, M. I., Paschall, R. T., Ferrett, R., & Alexander, R. (2011). Neisseria—Avoiding the jump to conclusions. *Journal of Child Sexual Abuse*, 20(6), 622-630.

Neisseria gonorrhoeae infection in a prepubertal child is virtually diagnostic of sexual abuse, provided perinatal infection has been excluded. Therefore, it is imperative that *Neisseria gonorrhoeae* be correctly identified. We present two cases of false positive *Neisseria gonorrhoeae* meningitis encountered at two different children's hospitals. Both cases were evaluated by the child protection teams prior to establishing the correct diagnosis.

Stewart, S. T. (2011). Hymenal characteristics in girls with and without a history of sexual abuse. *Journal of Child Sexual Abuse*, 20(5), 521-536.

This article reviews the recent literature on physical findings related to the hymen in pubertal and prepubertal girls with and without a history of sexual abuse. Characteristics of normal hymenal anatomy, acute traumatic findings, and characteristics of healed trauma are discussed, particularly with regard to changes in the interpretation of these findings that have occurred over time.

Thackeray, J. D., Hornor, G., Benzinger, E. A., & Scribano, P. V. (2011). [Forensic evidence collection and DNA identification in acute child sexual assault](#). *Pediatrics*, 128(2), 227-232.

To describe forensic evidence findings and reevaluate previous recommendations with respect to timing of evidence collection in acute child sexual assault and to identify factors associated with yield of DNA. This was a retrospective review of medical and legal records of patients aged 0 to 20 years who required forensic evidence collection. Ninety-seven of 388 (25%) processed evidence-collection kits were positive and 63 (65%) of them produced identifiable DNA. There were 20 positive samples obtained from children younger than 10 years; 17 of these samples were obtained from children seen within 24 hours of the assault. Three children had positive body samples beyond 24 hours after the assault, including 1 child positive for salivary amylase in the underwear and on the thighs 54 hours after the assault. DNA was found in 11 children aged younger than 10 years, including the child seen 54 hours after the assault. Collection of evidence within 24 hours of the assault was identified as an independent predictor of DNA detection. Identifiable DNA was collected from a child's body despite cases in which: evidence collection was performed >24 hours beyond the assault; the child had a normal/nonacute anogenital examination; there was no reported history of ejaculation; and the victim had bathed and/or changed clothes before evidence collection. Failure to conduct evidence collection on prepubertal children beyond 24 hours after the assault will result in rare missed opportunities to identify forensic evidence, including identification of DNA.

Adams, J. A. (2010). Medical Evaluation of Suspected Child Sexual Abuse: 2009 Update. *APSAC Advisor*, 22(1), 2-7.

Leventhal, J. M., Murphy, J. L., & Asnes, A. G. (2010). Evaluations of child sexual abuse: Recognition of overt and latent family concerns. *Child Abuse & Neglect*, 34(5), 289-295.

Newton, A. W., & Vandeven, A. M. (2010). The role of the medical provider in the evaluation of sexually abused children and adolescents. *Journal of Child Sexual Abuse, 19*(6), 669-686.

It was only 30 years ago that the medical community began to develop an increased awareness of child sexual abuse, and the role of the medical provider in the evaluation of sexually abused children has evolved significantly. As clinicians worldwide develop a greater understanding of the impact of the sexual abuse evaluation on the child, the roles of the physician and nurse have changed. In the United States, current practice often uses a multidisciplinary assessment involving skilled forensic interviewing of the child and a medical examination done by a medical provider with specialized training in sexual abuse. In order to minimize child interviews, these assessments are frequently held in settings such as child advocacy centers, where forensic interviewers and medical clinicians, child protective service workers, and police and district attorneys can work jointly to address the legal and protective issues in a coordinated fashion.

Scribano, P. V., Hornor, G., Rhoda, D., Curran, S., & Stevens, J. (2010). Multi-informant assessment of anxiety regarding ano-genital examinations for suspected child sexual abuse (CSA). *Child Abuse & Neglect, 34*(8), 602-609.

Given the commonly held belief that physical examinations for child sexual abuse (CSA) are very distressing, our primary objective was to evaluate anxiety during these assessments using the Multidimensional Anxiety Score for Children (MASC-10). A second objective was to compare self-reported anxiety to parental report using the MASC-10 and to medical provider's rating of emotional distress using the Genital Examination Distress Scale (GEDS). Child/parent dyads completed the MASC-10 prior to the evaluation and were retested at the completion of the medical exam. GEDS assessment occurred during the medical exam. One hundred seventy-five subject dyads were enrolled and were predominantly female (77%), Caucasian (66%), accompanied by mother (90%), and receiving Medicaid (57%). A significant subgroup of children reported clinically significant levels of anxiety at the pre-examination assessment (17.1%) and post-examination assessment (15.4%). However, most subjects reported low anxiety at both pre- and post-examination assessments. Both child and parent report demonstrated less anxiety, on average, post-examination compared to pre-examination scores. Reduced anxiety was measured with a mean pre-T-score = 55.8 versus mean post-T-score = 53.1 ($p < .001$). Correlation coefficients for

pre-T-scores and post-T-scores of child/parent dyad were 0.3257 ($p < .0001$) and 0.3403 ($p < .0001$). A small correlation was noted between child reported anxiety and medical provider observation using the GEDS for pre-exam (0.1904, $p = .01$), and post-exam (0.2090, $p = .02$). Our research indicates that the majority of children are not severely anxious during medical evaluations for CSA. In addition, the MASC-10 shows promise as an instrument to assess anxiety from the ano-genital examination in CSA because it could be quickly completed by most patients and their parents, indicated a wide range of anxiety levels, and demonstrated some sensitivity to change. While parent report may identify some child anxiety, parent and provider report should not be substitutes for the self-report of children's anxiety during this medical evaluation

Black, C. M., Driebe, E. M., Howard, L. A., Fajman, N. N., Sawyer, M. K., Girardet, R. G., ... & Hammerschlag, M. R. (2009). Multicenter study of nucleic acid amplification tests for detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in children being evaluated for sexual abuse. *The Pediatric Infectious Disease Journal*, 28(7), 608-613.

Diagnosis of sexually transmitted infections in children suspected of sexual abuse is challenging due to the medico-legal implications of test results. Currently, the forensic standard for diagnosis of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) infections is culture. In adults, nucleic acid amplification tests (NAATs) are superior to culture for CT, but these tests have been insufficiently evaluated in pediatric populations for forensic purposes. We evaluated the use of NAATs, using urine and genital swabs versus culture for diagnosis of CT and NG in children evaluated for sexual abuse in 4 US cities. Urine and a genital swab were collected for CT and NG NAATs along with routine cultures. NAAT positives were confirmed by PCR, using an alternate target. Prevalence of infection among 485 female children were 2.7% for CT and 3.3% for NG by NAAT. The sensitivity of urine NAATs for CT and NG relative to vaginal culture was 100%. Eight participants with CT-positive and 4 with NG-positive NAATs had negative culture results ($P = 0.018$ for CT urine NAATs vs. culture). There were 24 of 485 (4.9%) female participants with a positive NAAT for CT or NG or both versus 16 of 485 (3.3%) with a positive culture for either, resulting in a 33% increase in children with a positive diagnosis. These results suggest that NAATs on urine, with confirmation, are adequate for use as a new forensic standard for diagnosis of CT and NG in children suspected of sexual abuse. Urine NAATs offer a clear advantage over culture in sensitivity and are less invasive than swabs, reducing patient trauma and discomfort.

Patterson, D., & Campbell, R. (2009). A comparative study of the prosecution of childhood sexual abuse cases: The contributory role of pediatric forensic nurse examiner (FNE) programs. *Journal of Forensic Nursing*, 5(1), 38-45.

This study used a rigorous quasiexperimental design to compare prosecution outcomes for childhood sexual abuse (CSA) cases examined in a pediatric Forensic Nurse Examiner (FNE) program (the “intervention group”) (n= 95) to a comparison sample of CSA cases examined by non-FNE medical professionals prior to the inception of the FNE program (the “comparison group”) (n= 54). The types of cases in the intervention and comparison groups were different such that the FNE program had significantly more cases with younger victims where it was unknown or ambiguous whether they had penetration and/or fondling. Multivariate logit modeling was used to explore what factors predict legal case outcomes. Prosecution rates were significantly higher in the FNE group as opposed to the comparison group. In addition, cases with older victims who sustained penetration were the most likely to be prosecuted. Implications for forensic nursing practice are discussed.

Adams, J. A. (2008). Guidelines for medical care of children evaluated for suspected sexual abuse: An update for 2008. *Current Opinion in Obstetrics and Gynecology*, 20(5), 435-441.

Child sexual abuse is a common problem in our society and medical professionals who provide evaluations of children who may have been abused need to be updated as to recent research findings and recommendations for conducting examinations and interpreting results. Research studies have provided important new information regarding the qualifications of examiners, the recovery of forensic evidence in children, the frequency of abnormal findings in children and adolescents, the healing of genital injuries, and the interpretation of medical findings and sexually transmissible infections with respect to abuse. The recommendations for the timing and type of examinations for prepubertal children, in contrast to adolescent sexual assault victims, may need to be changed. Studies showing that partial tears of the hymen, as well as abrasions and contusions, may heal to leave very little or no sign of previous injury emphasize the importance of urgent evaluations. There is a need for standardization of the training of medical professionals who perform child sexual abuse evaluations to ensure continuing competence.

DeLago, C., Deblinger, E., Schroeder, C., & Finkel, M. A. (2008). [Girls who disclose sexual abuse: Urogenital symptoms and signs after genital contact](#). *Pediatrics*, 122(2), e281-e286.

Little information is available about idiosyncratic historical details provided by sexually abused girls, yet this information can help medical professionals diagnose sexual abuse. Our goals were to describe types and frequencies of urogenital symptoms/signs reported by girls who disclosed direct genital contact and to explore factors associated with this reporting. We reviewed 161 medical charts of 3- to 18-year-old girls who disclosed sexual abuse by direct genital contact for urogenital symptoms/signs, type of genital contact (oral, object, digital, or genital), time interval between last perpetrator contact and physical examination, age and sexual maturity at the time of last perpetrator contact, genital findings, and other medical diagnoses. Regression analyses were performed to determine factors that were most predictive of symptom/sign reporting. Many of the girls reported multiple types of genital contact; 33% reported oral/object-genital contact, 72% reported digital-genital contact, and 55% reported genital-genital contact. Sixty percent of the girls reported experiencing ≥ 1 symptom/sign; 53% of the total sample had genital pain, 37% had dysuria, and 11% had genital bleeding. Symptoms/signs were highly associated with genital-genital contact: 48% of the girls reporting genital-genital contact had dysuria compared with 25% of girls not reporting genital-genital contact, 72% had genital pain/soreness compared with 32% not reporting genital-genital contact, and 16% had bleeding compared with 4% of those not reporting genital-genital contact. Using regression analysis, the strongest factor predictive of symptom reporting by the girls was genital-genital contact. Sexually abused girls who experienced direct genital contact frequently reported symptoms related to the abusive episode. These symptoms were reported most frequently with genital-to-genital contact. This information sheds some light on the mechanism of injury leading to symptom reporting and can be used to further study symptoms/signs reported by sexually abused girls compared with the general population.

Adams, J. A., Kaplan, R. A., Starling, S. P., Mehta, N. H., Finkel, M. A., Botash, A. S., Kellogg, N. D., & Shapiro, R. A. (2007). Guidelines for medical care of children who may have been sexually abused. *Journal of Pediatric and Adolescent Gynecology*, 20(3), 163-172.

Sommers, M. S. (2007). [Defining patterns of genital injury from sexual assault: A review](#). *Trauma, Violence, & Abuse*, 8(3), 270-280.

The forensic examination following rape has two primary purposes: to provide health care and to collect evidence. Physical injuries need treatment so that they heal without adverse consequences. The pattern of injuries also has a forensic significance in that injuries are linked to the outcome of legal proceedings. This literature review investigates the variables related to genital injury prevalence and location that are reported in a series of retrospective reviews of medical records. The author builds the case that the prevalence and location of genital injury provide only a partial description of the nature of genital trauma associated with sexual assault and suggests a multidimensional definition of *genital injury pattern*. Several of the cited studies indicate that new avenues of investigation, such as refined measurement strategies for injury severity and skin color, may lead to advancements in health care, forensic, and criminal justice science.

Dubowitz, H. (2007). [Healing of hymenal injuries: implications for child health care professionals](#). *Pediatrics*, 119(5), 997-999.

A goal of the article was to assist with the timing of the hymenal injuries. The retrospective design, with varying periods to follow-up, made this difficult. The authors found, however, varying patterns of healing that suggest timing these injuries was difficult and of limited forensic value. Of note, they do report that petechiae had all disappeared within 2 to 3 days and that blood blisters lasted up to 1 month. These findings may help corroborate histories of when the alleged abuse occurred.

McCann, J., Miyamoto, S., Boyle, C., & Rogers, K. (2007). [Healing of hymenal injuries in prepubertal and adolescent girls: A descriptive study](#). *Pediatrics*, 119(5), e1094-e1106.

The objective of this study was to identify the healing process and outcome of hymenal injuries in prepubertal and adolescent girls. This multicenter, retrospective project used photographs to document the healing process and outcome of hymenal trauma that was sustained by 239

prepubertal and pubertal girls whose ages ranged from 4 months to 18 years. The injuries that were sustained by the 113 prepubertal girls consisted of 21 accidental or noninflicted injuries, 73 secondary to abuse, and 19 “unknown cause” injuries. All 126 pubertal adolescents were sexual assault victims. The hymenal injuries healed at various rates and except for the deeper lacerations left no evidence of the previous trauma. Abrasions and “mild” submucosal hemorrhages disappeared within 3 to 4 days, whereas “marked” hemorrhages persisted for 11 to 15 days. Only petechiae and blood blisters proved to be “markers” for determining the approximate age of an injury. Petechiae resolved within 48 hours in the prepubertal girls and 72 hours in the adolescents. A blood blister was detected at 34 days in an adolescent. As lacerations healed, their observed depth became shallower and their configuration smoothed out. Of the girls who sustained “superficial,” “intermediate,” or “deep” lacerations, 15 of 18 prepubertal girls had smooth and continuous appearing hymenal rims, whereas 24 of 41 adolescents' hymens had a normal, “scalloped” appearance and 30 of 34 had no disruption of continuity on healing. The final “width” of a hymenal rim was dependent on the initial depth of the laceration. No scar tissue formation was observed in either group of girls. The hymenal injuries healed rapidly and except for the more extensive lacerations left no evidence of a previous injury. There were no significant differences in the healing process and the outcome of the hymenal injuries in the 2 groups of girls.

Palusci, V. J., Cox, E. O., Shatz, E. M., & Schultze, J. M. (2006). Urgent medical assessment after child sexual abuse. *Child Abuse & Neglect*, 30(4), 367-380

Immediate medical assessment has been recommended for children after sexual abuse to identify physical injuries, secure forensic evidence, and provide for the safety of the child. However, it is unclear whether young children seen urgently within 72 hours of reported sexual contact would have higher frequencies of interview or examination findings as compared to those seen non-urgently or whether forensic findings would be affected by child characteristics, type of reported contact, or later events. We evaluated 190 consecutive cases of children under 13 years of age urgently referred during a 5-year period in 1998–2003 to a community child advocacy center and compared them to those non-urgently referred with regard to their physical examination findings, any sexually transmitted infections or forensic evidence, gender, pubertal development, type of contact, reported ejaculation, later bathing or changing clothes, time to examination, and gender, age and relationship of alleged perpetrator. Children seen urgently were younger and had less

frequent CPS involvement, more disclosures, and more positive physical examinations, and had more contact with older perpetrators than those seen non-urgently. Overall, most children were female and had normal or non-specific physical examinations. Certain case characteristics were predictive of evidence isolation in the 9% who had positive forensic evidence identified. Semen or sperm was identified from body swabs only from non-bathed, female children older than 10 years of age or on clothing or objects. Female children over 10 years old who report ejaculation or genital contact without bathing have the highest likelihood of positive examinations or forensic evidence. While there are other potential benefits of early examination, physicians seeking to identify forensic evidence should consider the needs of the child and other factors when determining the timing of medical assessment after sexual abuse.

Flaherty, E. G., & Sege, R. (2005). Barriers to physician identification and reporting of child abuse. *Pediatric Annals*, 34(5), 349-356.

Physicians systematically underidentify and underreport cases of child abuse. These medical errors may result in continued abuse, leading to potentially severe consequences. We have reviewed a number of studies that attempt to explain the reasons for these errors. The findings of these various studies suggest several priorities for improving the identification and reporting of child maltreatment: Improve continuing education about child maltreatment. Continuing education should focus not only on the identification of maltreatment but also on management and outcomes. This education should include an explanation of the role of CPS investigator and the physician's role in an investigation. The education should provide physicians with a better understanding of the overall outcome for children reported to CPS to help physicians gain perspective on the small number of maltreated children they may care for in their practice. This education should emphasize that the majority of maltreated children will benefit from CPS involvement. New York is the only state that mandates all physicians, as well as certain other professionals, take a 2-hour course called Identification and Reporting of Child Abuse and Maltreatment prior to licensing. Cited studies in this article suggest that such a mandate might be expected to improve identification and reporting, thereby encouraging other states to adopt similar regulations. Give physicians the opportunity to debrief with a trained professional after detecting and reporting child abuse. The concept of child abuse and the gravity of the decision to report can be troubling to the reporter. The debriefing

could include discussions of uncomfortable feelings physicians may experience related to their own countertransference reactions. Provide resources to assist physicians in making the difficult determination of suspected maltreatment. The role of accessible telephone consultation should be evaluated, along with formalized collaborations with local Emergency Departments with pediatric expertise. Improve the relationship between CPS and medical providers. For example, CPS workers should systematically inform the reporting physician about the progress of their investigation and the outcome for the child and family. Several past reports have made specific suggestions to improve the working relationship. Warner and Hanson recommended that positive outcomes be programmed into the reporting process. They suggested that CPS have special phone lines staffed by well-trained employees for mandated reporters to call. Finkelhor and Zellman proposed a more radical change to improve the working relationship between CPS and mandated reporters. They suggested that certain professionals, with demonstrated expertise in the recognition and treatment of child abuse and registered as such, should have "flexible reporting options." Options include the ability to defer reporting, if there are no immediate threats to a child, or to make a report in confidence and defer the investigation until necessary. Finkelhor and Zellman emphasized that this model would improve physician-reporting compliance and enhance the role of CPS while reducing the work burden for CPS. Improve interaction with the legal system. Child abuse pediatric experts who have courtroom experience could provide education and support to physicians who have little preexisting experience with the legal system. Reimbursement for time spent supporting legal proceedings should be equitable and may reduce physician concerns about lost patient revenue. Retrospective studies and vignette analyses provide much information about some of the barriers to child maltreatment reporting and describe many of the reasons why physicians do not identify and report all child maltreatment. Future prospective examinations of physician decision-making may further explain the physician's decision-making process and the barriers he or she faces when identifying and reporting child abuse.

Herrmann B., & Navratil, F. (2004) Sexual abuse in prepubertal children and adolescents. In C. Sultan (Ed.), *Pediatric and Adolescent Gynecology: Evidence-Based Clinical Practice Vol 7*. (pp.77-105). Karger.

Merritt, D. F. (2004). Vulvar and genital trauma in pediatric and adolescent gynecology. *Current Opinion in Obstetrics and Gynecology*, 16(5), 371-381.

This review will look critically at recent research articles that pertain to children and adolescents who present with genital injuries. Many recently published articles have noted that the history as given by the child or adolescent is the most important factor in determining the etiology of genital injuries as abuse or accidental. The history is more important than any documented or lack of documented findings on physical examination. Distinguishing whether the injury was accidental or caused by abuse is of significance to the family and the injured child or adolescent. Genital examinations of victims of documented abuse are often normal. Examinations of pregnant adolescents may appear normal, the only evidence that intercourse has taken place being pregnancy. Documented accidental genital injuries are described; unfortunately such injuries can easily be confused with sexual abuse. Photographic documentation of injuries by colposcopic photography has allowed a new level of peer review, improving the understanding of what are normal and non-specific findings, many of which were considered to be abnormal in the past. The psychological impact of living in a violent, war-torn culture, or surviving a traumatic genital injury are reviewed. New ideas on the management of genital trauma are also reported.

Heppenstall-Heger, A., McConnell, G., Ticson, L., Guerra, L., Lister, J., & Zaragoza, T. (2003). [Healing patterns in anogenital injuries: A longitudinal study of injuries associated with sexual abuse, accidental injuries, or genital surgery in the preadolescent child.](#) *Pediatrics*, 112(4), 829-837.

Objective. To study healing patterns of anogenital trauma in prepubescent children. A prospective 10-year study was conducted of 94 children who had anogenital trauma and were followed to healing and documented using a colposcope with 35-mm camera attachment. The 13 boys and 81 girls were referred with injuries as a result of sexual assault or anogenital trauma. Hymenal injuries occurred in 37 cases; 2 transections healed after surgery, and 15 persisted unchanged. Partial tears, hymenal abrasions, or hematomas healed completely or with minor nonspecific changes. Of the 47 injuries to the posterior fourchette, 22 abrasions, hematomas, or tears healed completely; 12

tears healed with vascular changes; 2 developed labial fusions; 10 lacerations required surgery; and 6 scarred and 4 healed with vascular changes. Only 2 of 39 cases of perihymenal trauma healed with vascular changes. All 17 cases of labial trauma healed completely. Anal trauma healed completely in 29 of 31 with scarring occurring in only 2 cases that required surgery. Anogenital trauma heals quickly, often without residua. Of the 94 cases, there were diagnostic anatomic changes in the 15 cases of hymenal transections (2 other cases healed completely with surgical reconstruction), 6 cases after surgical repair of posterior fourchette, and 2 cases of anal scarring after surgery.

Jones, J. S., Rossman, L., Wynn, B. N., Dunnuck, C., & Schwartz, N. (2003). [Comparative analysis of adult versus adolescent sexual assault: Epidemiology and patterns of anogenital injury](#). *Academic Emergency Medicine*, 10(8), 872-877.

To compare the characteristics of sexual assault in pubertal girls (<18 years old) and adults in a community-based population of women presenting to an urban sexual assault clinic. This case-series analysis evaluated consecutive female patients presenting to a sexual assault clinic during a three-year study period. The clinic is associated with a university-affiliated emergency medicine residency program and is staffed by forensic nurses trained to perform medicolegal examinations using colposcopy with nuclear staining. Patient demographics, assault characteristics, and injury patterns were recorded using a standardized classification system. Data from the two patient groups (adolescents vs. women ≥ 18 years of age) were analyzed using chi-square test and t-test. A total of 766 cases were identified: 43% of the victims were 13 to 17 years old (mean 15.0 years old), and 57% were older than 17 years old (mean 30.8 years old). Adolescents were more likely to be assaulted by an acquaintance or relative (84% vs. 50%, $p < 0.001$) and to delay medical evaluation (17 hours vs. 12 hours, $p < 0.001$) than were older women. Adolescent sexual assault was less likely to involve weapons or physical coercion (29% versus 57%, $p < 0.001$) and was associated with fewer nongenital injuries (33% vs. 55%, $p < 0.001$). Adolescents had a greater frequency of anogenital injuries (83% vs. 64%, $p < 0.001$), however, compared with older women. Common sites of injury in adolescents were posterior, including the fossa navicularis, hymen, fourchette, and labia minora. The injuries showed consistent topologic features, varying with the site and nature of tissue. Adult victims of sexual assault had a less consistent pattern of anogenital injuries with fewer hymenal injuries, greater injury to the perianal area, and widespread

erythema. Of women presenting to an urban sexual assault clinic, 43% were adolescents. The epidemiology of sexual trauma and the pattern of anogenital trauma in this age group are unique and may pose special challenges to emergency health care providers.

Benger, J. R., & Pearce, A. V. (2002). [Quality improvement report: Simple intervention to improve detection of child abuse in emergency departments.](#) *BMJ: British Medical Journal*, 324(7340), 780.

Child abuse is easily overlooked in a busy emergency department. Two stage audit of 1000 children before and after introduction of reminder flowchart. An emergency department in a suburban teaching hospital seeing about 4000 injured preschool children a year. Number of records in which intentional injury was adequately documented and considered and the number of children referred for further assessment before and after introduction of reminder flowchart into emergency department notes.

Finkel, M. A., & Giardino, A. P. (Eds.). (2002). *Medical evaluation of child sexual abuse: A practical guide.* Sage.

Nelson, D. G., & Santucci, K. A. (2002). [An alternate light source to detect semen.](#) *Academic Emergency Medicine*, 9(10), 1045-1048.

The Wood's lamp (WL) has been used in sexual assault evaluations. Recent data have shown that semen does not fluoresce with a WL and that physicians are unable to differentiate semen from other common medicaments using a WL. To determine whether physicians could differentiate semen from other products using an alternate light source (ALS), and to investigate whether a brief training period with the ALS would enhance physicians' ability to differentiate between semen and other commonly used products. An ALS, Bluemaxx BM500, was found to cause semen to fluoresce. Physicians were first asked to use this ALS to identify semen and then to distinguish between a semen sample and other products. Physicians then received a training class on the use of the ALS and were then asked to differentiate semen from other products. All physicians identified the semen as fluorescing and 25% successfully differentiated the semen from the other products using the ALS. Products most commonly mistaken for semen were a hand cream, Castille

soap, and bacitracin. After the training session, 83% of the physicians successfully differentiated the semen from other products. The ALS, while not specific for semen identification, was 100% sensitive for it. Physicians instructed in the use of an alternate light source (BM 500) are able to identify semen as fluorescing and can differentiate semen (after a training session) from other commonly used products.

Adams, J. A., Girardin, B., & Faugno, D. (2001). Adolescent sexual assault: Documentation of acute injuries using photo-colposcopy. *Journal of Pediatric and Adolescent Gynecology*, 14(4), 175-180.

To document the frequency and types of genital injuries in adolescent women examined acutely following a sexual assault, and determine any historical correlates of injury Design: Retrospective chart review. Sexual Assault Response Team services at a community hospital in an urban setting. All female patients aged 14–19 yr who were referred by law enforcement for an acute sexual assault examination and were examined between May 1994 and May 1999. The frequency of signs of genital trauma at various anal and genital sites, as recorded by the examining clinician. Charts of 214 female subjects (mean age 16.3 yr) were reviewed. The most common findings were posterior fourchette tear (36%); erythema of the labia minora, hymen, cervix, or posterior fourchette (18%–32%); and swelling of the hymen (19%). Time to examination was highly correlated with the degree of injury noted ($P = .000$). The incidence of hymenal tears in self-described virgins was higher than in nonvirgins (19% vs. 3%, $P = .008$); however, the total number or severity of other injuries was not significantly higher in virgins. Victims reporting anal penetration had a higher frequency of anal injuries than those who denied such contact (14/31, 61% vs. 2/150, 1%; $P = .000$). Tears of the posterior fourchette or fossa were the most common findings (40%). Hymenal tears were uncommon, even in self-described virginal girls. Timely examination of adolescent victims is important to document injuries; however, many victims will still not have signs of bruising, abrasions, or tears.

Lahoti, S. L., McClain, N., Girardet, R., McNeese, M., & Cheung, K. (2001). [Evaluating the child for sexual abuse](#). *American Family Physician*, 63(5), 883-896.

Child victims of sexual abuse may present with physical findings that can include anogenital problems, enuresis or encopresis. Behavioral changes may involve sexual acting out, aggression, depression, eating disturbances and regression. Because the examination findings of most child victims of sexual abuse are within normal limits or are nonspecific, the child's statements are extremely important. The child's history as obtained by the physician may be admitted as evidence in court trials; therefore, complete documentation of questions and answers is critical. A careful history should be obtained and a thorough physical examination should be performed with documentation of all findings. When examining the child's genitalia, it is important that the physician be familiar with normal variants, nonspecific changes and diagnostic signs of sexual abuse. Judicious use of laboratory tests, along with appropriate therapy, should be individually tailored. Forensic evidence collection is indicated in certain cases. Referral for psychological services is important because victims of abuse are more likely to have depression, anxiety disorders, behavioral problems and post-traumatic stress disorder.

Berenson, A. B., Chacko, M. R., Wiemann, C. M., Mishaw, C. O., Friedrich, W. N., & Grady, J. J. (2000). A case-control study of anatomic changes resulting from sexual abuse. *American Journal of Obstetrics and Gynecology*, 182(4), 820-834.

Our goal was to identify vulvar and hymenal characteristics associated with sexual abuse among female children between the ages of 3 and 8 years. Using a case-control study design, we examined and photographed the external genitalia of 192 prepubertal children with a history of penetration and 200 children who denied prior abuse. Bivariate analyses were conducted by χ^2 , the Fisher exact test, and the Student t test to assess differences in vulvar and hymenal features between groups. Vaginal discharge was observed more frequently in abused children ($P = .01$). No difference was noted in the percentage of abused versus nonabused children with labial agglutination, increased vascularity, linea vestibularis, friability, a perineal depression, or a hymenal bump, tag, longitudinal intravaginal ridge, external ridge, band, or superficial notch. Furthermore, the mean number of each of these features per child did not differ between groups. A hymenal transection, perforation, or deep notch was observed in 4 children, all of whom were

abused. The genital examination of the abused child rarely differs from that of the nonabused child. Thus, legal experts should focus on the child's history as the primary evidence of abuse.

Christian, C. W., Lavelle, J. M., De Jong, A. R., Loiselle, J., Brenner, L., & Joffe, M. (2000). [Forensic evidence findings in prepubertal victims of sexual assault.](#) *Pediatrics*, 106(1), 100-104.

The American Academy of Pediatrics recommends forensic evidence collection when sexual abuse has occurred within 72 hours, or when there is bleeding or acute injury. It is not known whether these recommendations are appropriate for prepubertal children, because few data exist regarding the utility of forensic evidence collection in cases of child sexual assault. This study describes the epidemiology of forensic evidence findings in prepubertal victims of sexual assault.

The medical records of 273 children <10 years old who were evaluated in hospital emergency departments in Philadelphia, Pennsylvania, and had forensic evidence processed by the Philadelphia Police Criminalistics Laboratory were retrospectively reviewed for history, physical examination findings, forensic evidence collection, and forensic results. Some form of forensic evidence was identified in 24.9% of children, all of whom were examined within 44 hours of their assault. Over 90% of children with positive forensic evidence findings were seen within 24 hours of their assault. The majority of forensic evidence (64%) was found on clothing and linens, yet only 35% of children had clothing collected for analysis. After 24 hours, all evidence, with the exception of 1 pubic hair, was recovered from clothing or linens. No swabs taken from the child's body were positive for blood after 13 hours or sperm/semen after 9 hours. A minority of children (23%) had genital injuries. Genital injury and a history of ejaculation provided by the child were associated with an increased likelihood of identifying forensic evidence, but several children had forensic evidence found that was unanticipated by the child's history. The general guidelines for forensic evidence collection in cases of acute sexual assault are not well-suited for prepubertal victims. The decision to collect evidence is best made by the timing of the examination. Swabbing the child's body for evidence is unnecessary after 24 hours. Clothing and linens yield the majority of evidence and should be pursued vigorously for analysis.

Kellogg, N. D., Lamb, J. L., & Lukefahr, J. L. (2000). The use of telemedicine in child sexual abuse evaluations. *Child Abuse & Neglect*, 24(12), 1601-1612.

Objective: To describe the advantages, disadvantages and current status of child abuse consultations conducted through telemedicine networks. The results of a telephone survey of seven statewide telemedicine networks are reported and discussed with respect to goals, funding, technical support and expertise, infrastructure, and extent of use. Quality assurance and liability issues concerning telemedicine child abuse consultations are also reviewed. The goals of telemedicine networks in child abuse are to provide (1) expertise to less experienced clinicians primarily in rural areas; (2) a method for peer review and quality assurance to build consensus of opinions particularly in sexual abuse cases; and (3) support for professionals involved in an emotionally burdensome area of pediatrics. Problems encountered by existing networks include: (1) funding for equipment and reimbursement for consultation; (2) consistent technical support; (3) clinician lack of technical expertise, knowledge, or motivation; and (4) lack of network infrastructure. Legal considerations include licensure exemptions for consulting across state lines, potential for malpractice, patient confidentiality and security of images forwarded over modem lines, and liability of the equipment, consulting site, and the consultant in criminal proceedings. Telemedicine consultations offer a unique opportunity to raise the standard of care in child abuse evaluations, but success depends on clinician motivation, appropriate infrastructure, and ongoing funding and technical support.

Kellogg, N. D., Parra, J. M., & Menard, S. (1998). [Children with anogenital symptoms and signs referred for sexual abuse evaluations.](#) *Archives of Pediatrics & Adolescent Medicine*, 152(7), 634-641.

To determine whether children referred to a sexual abuse clinic because of anogenital symptoms or signs have examination findings that are suggestive of or probable or definitive for sexual abuse. Case series of 157 patients. Child and adolescent ambulatory care sexual abuse clinic. A medical records review of 3660 cases was done; 157 cases were identified for study. Most (75%) referrals were from medical clinics. Of 184 complaints, the most common presenting symptom or sign was anogenital bleeding or bruising (29.3%), followed by irritation or redness (21.7%), abnormal anogenital anatomy (20.7%), vaginal discharge (18.4%), lesions (6.5%), and "other" symptoms or signs (3.3%). We used a standardized classification system and determined that 25

patients (15%) had examination findings in the sexual abuse clinic that were suggestive of or probable or definitive for sexual abuse. Although 85 patients had examination findings that corroborated the presenting symptom(s), 70 had nonspecific examination findings or a diagnosis other than sexual abuse. Seventy-two patients had normal examination findings. Only patients with the presenting symptom of lesions had an increased likelihood of a sexual abuse diagnosis. Common examination findings included anogenital erythema, enhanced vascularity of the hymen or vestibule in prepubertal girls, labial adhesions, and culture-negative vaginitis. Few children are referred for sexual abuse evaluations based on physical signs or symptoms alone. Children with anogenital symptoms but without a disclosure or suspicion of sexual abuse are unlikely to have examination findings suggestive of abuse. The evaluation of children with anogenital symptoms and signs should include a consideration of alternative conditions and causes not directly related to sexual abuse. CHILD SEXUAL abuse is a common pediatric problem affecting approximately 12% of girls younger than 14 years.¹ Medical evaluations are commonly requested in children who are suspected victims of sexual abuse. Detecting sexual abuse is challenging because many children do not disclose their abuse, and physical findings tend to be absent or nonspecific. The accurate detection of findings associated with sexual abuse also depends on a familiarity with variations in anogenital anatomy that have been described in children who have not been abused. Sexual abuse of children is sometimes detected in clinical settings. The children may present with anogenital symptoms or signs, including bleeding, pain, inflammation, and vaginal discharge. Alternatively, they may be asymptomatic, and a clinician may uncover suspicious findings during the anogenital examination. Clinicians are challenged to differentiate symptoms or findings attributable to sexual abuse from physiologic, skin, or other conditions. This determination is critical in addressing the safety needs of a child and providing appropriate treatment. Although the detection of sexual abuse is of unquestionable importance, a mistaken diagnosis can be traumatizing to the child, family, and persons who are suspected of abuse. The purpose of this study is to determine whether children who have not disclosed abuse but who are referred for sexual abuse evaluations because of anogenital symptoms or signs have examination findings that are suggestive of or probable or definitive for sexual abuse. The probability of sexual abuse was assessed using a standardized classification system.

Myers, J. E. (1998). Forensic impact of the child sexual abuse medical examination. *Child Abuse & Neglect*, 22(6), 653-656.

This commentary on an article about research issues at the interface of medicine and law concerning medical evaluation for child sexual abuse focuses on empirically testable questions: (1) the medical history--its accuracy, interviewing issues, and elicitation and preservation of verbal evidence of abuse; and, (2) expert testimony.

Adams, J. A. (1997). Sexual abuse and adolescents. *Pediatric Annals*, 26(5), 299-304.

Botash, A. S. (1997). Examination for sexual abuse in prepubertal children: An update. *Pediatric Annals*, 26(5), 312-320.

The complete physical examination of prepubertal children should always include a genital examination. Most children, even those who have been sexually abused, will have a normal genital examination. A child's acceptance and tolerance for this aspect of the examination will be enhanced by use of the techniques described. Sexually abused children may be identified through routine review of systems and history, including behavioral and psychosocial, and open-ended questions regarding sexual abuse. Regular genital examinations will also help to identify sexually abused children. Although the diagnosis of sexual abuse can never rely solely on physical findings, abnormal findings suspicious for sexual abuse are significantly more useful if there have been prior documented normal examinations. When sexually abused children initially present to their medical practitioner, the practitioner should obtain a complete medical and psychosocial history and perform a thorough examination. The practitioner need not be an expert in the interpretation of the possible legal significance of specific genital findings but should recognize normal, abnormal, and suspicious findings. Reassurance from a trusted practitioner relating to a normal body can be the most valuable treatment for a child's emotional healing. Practitioners need to be aware of the resources in their community for medical evaluations for sexual abuse, legal investigations, and mental health referrals. If there is a local center for child abuse evaluations, such as a Child Advocacy Center or Center of Excellence for child protection, practitioners should consider referrals to and consultations with these resources.

De San Lazaro, C. (1995). [Making paediatric assessment in suspected sexual abuse a therapeutic experience.](#) *Archives of Disease in Childhood*, 73(2), 174-176.

Bays, J., & Chadwick, D. (1993). Medical diagnosis of the sexually abused child. *Child Abuse & Neglect*, 17(1), 91-110.

This article reviews what has been learned in the last two decades about the medical diagnosis of child sexual abuse. Studies indicate that a normal physical exam is common in sexual abuse victims, that healing of injuries due to abuse is rapid and sometimes complete, that a minority of victims seen for abuse are boys, that nonsexual transmission of sexually transmitted diseases is rare, and that congenital and acquired conditions may mimic physical findings caused by sexual abuse. The article summarizes clinical research on physical findings in nonabused children, abused children, and abused children with independent confirmation of abuse. A classification of physical findings is proposed along a continuum of certainty that sexual abuse has occurred. The child's history is essential in the accurate diagnosis of most cases of sexual abuse.

McCann, J., Voris, J., & Simon, M. (1992). Genital injuries resulting from sexual abuse: A longitudinal study. *Pediatrics*, 89(2), 307-317.

Three children who incurred genital injuries as a result of sexual assaults were followed up on a longitudinal basis to document the anatomical changes which ensued. The subjects, who were 4 months, 4 years 5 months, and 9 years of age, were followed up for periods ranging from 14 months to 3 years. A multi-method examination approach and a 35-mm camera mounted on a colposcope were used to examine and record their injuries. Signs of the acute damage disappeared rapidly, and the wounds healed without complications. Following the resolution of the acute injuries, the changes created by the trauma remained relatively stable throughout the prepubertal years. The most persistent findings were irregular hymenal edges and narrow rims at the point of the injury. Over time the jagged, angular margins smoothed off. Disruption of the hymen exposed underlying longitudinal intravaginal ridges whose hymenal attachments created mounds or projections. There was little apparent scar formation. Even the injuries to the posterior fourchettes healed with minimal scar tissue and left only the slightest evidence of the trauma. With the onset of puberty, the hymenal changes in the oldest subject were obscured by the hypertrophy of this membrane. An

examination technique which used a Q-tip to separate the redundant tissues demonstrated that the signs of trauma had survived.

Brayden, R. M., Altemeier III, W. A., Yeager, T., & Muram, D. (1991). Interpretations of colposcopic photographs: Evidence for competence in assessing sexual abuse?. *Child Abuse & Neglect*, 15(1), 69-76.

Accurate assessment of physical findings for child sexual abuse is medically and legally important. This study evaluated (1) interobserver reliability of clinicians rating colposcopic photographs, and (2) correlates of reliable interpretations. Seventy physicians and two nurse practitioners, divided by professional levels, assessed colposcopic photographs and completed a questionnaire. Ratings by a professional with extensive experience in this field were used as an accuracy standard. Leaders in the field of child sexual abuse assessment made significantly more “accurate” assessments than pediatricians, pediatric and family practice residents, and intern physicians. Leaders made fewer “inaccurate” interpretations than interns. Predictors of agreement with standard assessments, although weak, were knowledge of female perineal anatomy and professional level. Total number of sexual abuse examinations conducted and knowledge of sexually transmitted diseases as acquired by children were not significant predictors of accurate assessment. The findings are interpreted as to their potential relevance to actual sexual abuse evaluations of children.

Policy and Procedure

Keeshin, B., Forkey, H. C., Fouras, G., MacMillan, H. L., ABUSE, C. O. C., NEGLECT, C. O. F. C., & AMERICAN ACADEMY OF PEDIATRICS. (2020). Children exposed to maltreatment: Assessment and the role of psychotropic medication. *Pediatrics*, *145*(2), e20193751.

Pediatricians regularly care for children who have experienced child abstract maltreatment. Child maltreatment is a risk factor for a broad range of mental health problems. Issues specific to child maltreatment make addressing emotional and behavioral challenges among maltreated children difficult. This clinical report focuses on 2 key issues necessary for the care of maltreated children and adolescents in pediatric settings: trauma-informed assessments and the role of pharmacotherapy in maltreated children and adolescents. Specific to assessment, current or past involvement of the child in the child welfare system can hinder obtaining necessary information or access to appropriate treatments. Furthermore, trauma-informed assessments can help identify the need for specific interventions. Finally, it is important to take both child welfare system and trauma-informed assessment approaches into account when considering the use of psychotropic agents because there are critical diagnostic and systemic issues that affect the prescribing and discontinuing of psychiatric medications among children with a history of child maltreatment.

Flaherty, E., Legano, L., Idzerda, S., & ABUSE, C. O. C. (2019). [Ongoing pediatric health care for the child who has been maltreated](#). *Pediatrics*, *143*(4), e20190284

Pediatricians provide continuous medical care and anticipatory guidance for children who have been reported to state child protection agencies, including tribal child protection agencies, because of suspected child maltreatment. Because families may continue their relationships with their pediatricians after these reports, these primary care providers are in a unique position to recognize and manage the physical, developmental, academic, and emotional consequences of maltreatment and exposure to childhood adversity. Substantial information is available to optimize follow-up medical care of maltreated children. This new clinical report will provide guidance to pediatricians about how they can best oversee and foster the optimal physical health, growth, and development of children who have been maltreated and remain in the care of their biological family or are returned to their care by Child Protective Services agencies. The report describes the pediatrician's

role in helping to strengthen families' and caregivers' capabilities and competencies and in promoting and maximizing high-quality services for their policies from the American Academy of Pediatrics for more information about the emotional and behavioral consequences of child maltreatment and the treatment of these consequences.

Turnbull, J., Arenth, J., Payne, K., Lantos, J. D., & Fanning, J. (2019). [When only family is available to interpret](#). *Pediatrics*, *143*(4), e20183700

When caring for patients and families who do not speak English, medical interpreters are necessary. Sometimes, our patients' families speak languages or dialects for which no in-person or video or phone interpreter can be found. If a family member is bilingual, the members of the medical team must make a difficult choice. Is it better to use a family member as translator or to not be able to communicate at all? In this article, we present the case of a critically ill patient with complicated pathophysiology whose family speaks a rare Guatemalan dialect for which no medical interpreters can be identified.

Hoehn, E. F., Overmann, K. M., Fananapazir, N., Simonton, K., Makoroff, K. L., Bennett, B. L., ... & Kurowski, E. M. (2018). Improving emergency department care for pediatric victims of sexual abuse. *Pediatrics*, *142*(6), e20181811.

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. 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. 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. 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.

Meunier-Sham, J., Cross, T. P., & Zuniga, L. (2013). The seven pillars of quality care in a statewide pediatric sexual assault nurse examiner program. *Journal of Child Sexual Abuse, 22*(7), 777-795.

This article describes a systematic approach used by a statewide pediatric sexual assault nurse examiner program to ensure the quality of forensic medical examinations it provides in child sexual abuse investigations. Seven strategies for enhancing quality are described: (a) hiring experienced professionals, (b) effective training, (c) comprehensive protocols, (d) ample support for pediatric sexual assault nurses, (e) management oversight, (f) a clinical coordinator to provide ongoing training and technical assistance, and (g) a quality assurance process in which expert child abuse pediatricians review each statewide pediatric sexual assault nurse examination. To show the evolution of quality care over time, the program's experience from 2004 to 2010 is reviewed, and quality assurance data are analyzed.

Garner, A. S., Shonkoff, J. P., Siegel, B. S., Dobbins, M. I., Earls, M. F., McGuinn, L., ... & Wood, D. L. (2012). [Early childhood adversity, toxic stress, and the role of the pediatrician: Translating developmental science into lifelong health.](#) *Pediatrics, 129*(1), e224-e231.

Advances in a wide range of biological, behavioral, and social sciences are expanding our understanding of how early environmental influences (the ecology) and genetic predispositions (the biologic program) affect learning capacities, adaptive behaviors, lifelong physical and mental health, and adult productivity. A supporting technical report from the American Academy of Pediatrics (AAP) presents an integrated ecobiodevelopmental framework to assist in translating these dramatic advances in developmental science into improved health across the life span.

Pediatricians are now armed with new information about the adverse effects of toxic stress on brain development, as well as a deeper understanding of the early life origins of many adult diseases. As trusted authorities in child health and development, pediatric providers must now complement the early identification of developmental concerns with a greater focus on those interventions and community investments that reduce external threats to healthy brain growth. To this end, AAP endorses a developing leadership role for the entire pediatric community—one that mobilizes the scientific expertise of both basic and clinical researchers, the family-centered care of the pediatric medical home, and the public influence of AAP and its state chapters—to catalyze fundamental change in early childhood policy and services. AAP is committed to leveraging science to inform the development of innovative strategies to reduce the precipitants of toxic stress in young children and to mitigate their negative effects on the course of development and health across the life span.

Christian, C. W. (2011). Timing of the medical examination. *Journal of Child Sexual Abuse*, 20(5), 505-520.

The medical examination of the sexually abused child may have evidentiary, medical, and therapeutic purposes, and the timing of the examination requires consideration of each of these objectives. In cases of acute sexual assault, emergent examinations may be needed to identify injury, collect forensic evidence, and provide infection and pregnancy prophylaxis. Alternately, most sexually abused children are not identified immediately after assault, and the timing of the examination needs to balance physical and emotional issues with the availability of qualified examiners. In all cases, the best interests of the child should be paramount.

Christian, C. W., & Feldman, K. W. (2011). [Protecting children from sexual abuse by health care providers](#). *Pediatrics*, 128(2), 407-426.

Sexual abuse or exploitation of children is never acceptable. Such behavior by health care providers is particularly concerning because of the trust that children and their families place on adults in the health care profession. The American Academy of Pediatrics strongly endorses the social and moral prohibition against sexual abuse or exploitation of children by health care providers. The academy opposes any such sexual abuse or exploitation by providers, particularly by the academy's members. Health care providers should be trained to recognize and abide by appropriate provider-patient boundaries. Medical institutions should screen staff members for a

history of child abuse issues, train them to respect and maintain appropriate boundaries, and establish policies and procedures to receive and investigate concerns about patient abuse. Each person has a responsibility to ensure the safety of children in health care settings and to scrupulously follow appropriate legal and ethical reporting and investigation procedures.

Girardet, R., Bolton, K., Lahoti, S., Mowbray, H., Giardino, A., Isaac, R.,... & Paes, N. (2011). [Collection of forensic evidence from pediatric victims of sexual assault](#). *Pediatrics*, 128(2), 233-238.

American Academy of Pediatrics. Committee on Child Abuse and Neglect. (2010). [Policy Statement-Child abuse, confidentiality, and the health insurance portability and accountability act](#). *Pediatrics*, 125(1), 197-201.

The federal Health Insurance Portability and Accountability Act (HIPAA) of 1996 has significantly affected clinical practice, particularly with regard to how patient information is shared. HIPAA addresses the security and privacy of patient health data, ensuring that information is released appropriately with patient or guardian consent and knowledge. However, when child abuse or neglect is suspected in a clinical setting, the physician may determine that release of information without consent is necessary to ensure the health and safety of the child. This policy statement provides an overview of HIPAA regulations with regard to the role of the pediatrician in releasing or reviewing patient health information when the patient is a child who is a suspected victim of abuse or neglect. This statement is based on the most current regulations provided by the US Department of Health and Human Services and is subject to future changes and clarifications as updates are provided.

Thackeray, J. D., Hibbard, R., & Dowd, M. D. The Committee on Child Abuse and Neglect, and the Committee on Injury, Violence, and Poison Prevention (2010). [Intimate partner violence: The role of the pediatrician](#). *Pediatrics*, 125(5), 1094-1100.

This policy is a revision of the policy in [101 \(6\): 1091](#).

The American Academy of Pediatrics and its members recognize the importance of improving the physician's ability to recognize intimate partner violence (IPV) and understand its effects on child health and development and its role in the continuum of family violence. Pediatricians are in a unique position to identify abused caregivers in pediatric settings and to evaluate and treat children

raised in homes in which IPV may occur. Children exposed to IPV are at increased risk of being abused and neglected and are more likely to develop adverse health, behavioral, psychological, and social disorders later in life. Identifying IPV, therefore, may be one of the most effective means of preventing child abuse and identifying caregivers and children who may be in need of treatment and/or therapy. Pediatricians should be aware of the profound effects of exposure to IPV on children.

American Academy of Pediatrics. Section on Radiology. (2009). Diagnostic imaging of child abuse. *Pediatrics*, 123(5), 1430-1435.

The role of imaging in cases of child abuse is to identify the extent of physical injury when abuse is present and to elucidate all imaging findings that point to alternative diagnoses. Effective diagnostic imaging of child abuse rests on high-quality technology as well as a full appreciation of the clinical and pathologic alterations occurring in abused children. This statement is a revision of the previous policy published in 2000.

Lane, W. G., & Dubowitz, H. (2009). Primary care physicians' experience, comfort and competence in the evaluation and management of child maltreatment: Do we need child abuse experts? *Child Abuse & Neglect*, 33(2), 76-83.

Flaherty, E. G., Sege, R. D., Griffith, J., Price, L. L., Wasserman, R., Slora, E., ... & Binns, H. J. (2008). From suspicion of physical child abuse to reporting: Primary care clinician decision-making. *Pediatrics*, 122(3), 611-619.

The goals were to determine how frequently primary care clinicians reported suspected physical child abuse, the levels of suspicion associated with reporting, and what factors influenced reporting to child protective services. In this prospective observational study, 434 clinicians collected data on 15003 child injury visits, including information about the injury, child, family, likelihood that the injury was caused by child abuse (5-point scale), and whether the injury was reported to child protective services. Data on 327 clinicians indicating some suspicion of child abuse for 1683 injuries were analyzed. Clinicians reported 95 (6%) of the 1683 patients to child protective services. Clinicians did not report 27% of injuries considered likely or very likely caused by child abuse and 76% of injuries considered possibly caused by child abuse. Reporting rates were

increased if the clinician perceived the injury to be inconsistent with the history and if the patient was referred to the clinician for suspected child abuse. Patients who had an injury that was not a laceration, who had >1 family risk factor, who had a serious injury, who had a child risk factor other than an inconsistent injury, who were black, or who were unfamiliar to the clinician were more likely to be reported. Clinicians who had not reported all suspicious injuries during their career or who had lost families as patients because of previous reports were more likely to report suspicious injuries. Clinicians had some degree of suspicion that ~10% of the injuries they evaluated were caused by child abuse. Clinicians did not report all suspicious injuries to child protective services, even if the level of suspicion was high (likely or very likely caused by child abuse). Child, family, and injury characteristics and clinician previous experiences influenced decisions to report.

Hibbard, R. A., Desch, L. W., and the Committee on Child Abuse and Neglect and Council on Children with Disabilities. (2007). Maltreatment of children with disabilities. *American Academy of Pediatrics, 119*(5), 1018-1025.

Widespread efforts are being made to increase awareness and provide education to pediatricians regarding risk factors of child abuse and neglect. The purpose of this clinical report is to ensure that children with disabilities are recognized as a population that is also at risk of maltreatment. Some conditions related to a disability can be confused with maltreatment. The need for early recognition and intervention of child abuse and neglect in this population, as well as the ways that a medical home can facilitate the prevention and early detection of child maltreatment, are the subject of this report.

Kellogg, N. (2005). [The evaluation of sexual abuse in children](#). *Pediatrics, 116*(2), 506-512.

This clinical report serves to update the statement titled “Guidelines for the Evaluation of Sexual Abuse of Children,” which was first published in 1991 and revised in 1999. The medical assessment of suspected sexual abuse is outlined with respect to obtaining a history, physical examination, and appropriate laboratory data. The role of the physician may include determining the need to report sexual abuse; assessment of the physical, emotional, and behavioral

consequences of sexual abuse; and coordination with other professionals to provide comprehensive treatment and follow-up of victims.

American Academy of Pediatrics. Committee on Child Abuse and Neglect and Committee on Children with Disabilities (2001). [Assessment of maltreatment of children with disabilities](#). *Pediatrics*, 108(2), 508-512.

Widespread efforts are continuously being made to increase awareness and provide education to pediatricians regarding risk factors of child abuse and neglect. The purpose of this statement is to ensure that children with disabilities are recognized as a population that is also at risk for maltreatment. The need for early recognition and intervention of child abuse and neglect in this population, as well as the ways that a medical home can facilitate the prevention and early detection of child maltreatment, should be acknowledged.

Normal Findings

Anderson, B., Thimmesch, I., Aardsma, N., Terrell, M., Carstater, S., & Schober, J. (2014). The prevalence of abnormal genital findings, vulvovaginitis, enuresis and encopresis in children who present with allegations of sexual abuse. *Journal of Pediatric Urology, 10*(6), 1216-1221.

Objective: To assess the prevalence of vulvovaginitis, enuresis and encopresis in children who were referred for allegations of sexual abuse. A retrospective chart review of 1280 children presenting for non-acute examination after allegations of sexual abuse during a 15-year time span. Interview documentation, physical examination documentation, urinalysis, urine and vaginal cultures were reviewed. Of the 1280 children, 73.3% were female and 26.7% male. The ages of the children ranged from 6 months to 18 years (median age was 6 years). Interviews revealed that fondling contact was the most common allegation, followed by oral, vaginal, and anal penetration. Interviews also disclosed lower urinary tract symptoms, UTI, constipation, encopresis and enuresis. Physical examination revealed no abnormal genital findings in 44.7% of cases. Examinations of the vagina noted: erythema (18.1%); hymenal notching (posterior 16.8%, anterior 4.4%); vulvovaginitis (14.0%); laceration or transection (0.6%); and bruising (0.4%). Examination of the anus noted: anal fissure/tear (14.9%); loss of anal tone (10.6%); reflex anal dilatation (9.2%); venous congestion (3.8%); and proctitis (0.9%). Vulvovaginitis was noted in 14% (131/ 936) and encopresis in 2.3% (21/936). Enuresis according to age was reported in 13% of 5e9 year olds, 14.7% of 10e16 year olds and 18.2% of 17e18 year olds suspected of being abused.

Hornor, G. (2010). A normal ano-genital exam: Sexual abuse or not?. *Journal of Pediatric Health Care, 24*(3), 145-151.

Sexual abuse is a problem of epidemic proportions in the United States. Pediatric nurse practitioners (PNPs) are at the forefront of providing care to children and families. The PNP is in a unique position to educate patients and families regarding sexual abuse and dispel common myths associated with sexual abuse. One such myth is that a normal ano-genital examination is synonymous with the absence of sexual abuse. This article will provide primary care providers, including PNPs, with a framework for understanding why a normal ano-genital examination does not negate the possibility of sexual abuse/assault. Normal ano-genital anatomy, changes that occur with puberty, and physical properties related to the genitalia and anus will be discussed. Photos

will provide visualization of both normal variants of the pre-pubertal hymen and genitalia as well as changes that occur with puberty. Implications for practice for PNP's will be discussed.

Anderst, J., Kellogg, N., & Jung, I. (2009). [Reports of repetitive penile-genital penetration often have no definitive evidence of penetration](#). *Pediatrics*, 124(3), e403-e409.

The goals were to evaluate the association of definitive hymenal findings with the number of reported episodes of penilegenital penetration, pain, bleeding, dysuria, and time since assault for girls presenting for nonacute, sexual assault examinations. Charts of all girls 5 to 17 of age who provided a history of nonacute, penile-genital, penetrative abuse were reviewed. Interviews and examinations occurred over a 4-year period at a children's advocacy center. Characteristics of the histories provided by the subjects were examined for associations with definitive findings of penetrative trauma. Five hundred six patients were included in the study. Of the 56 children with definitive examination results, 52 had no history of consensual penile-vaginal intercourse and all were ≤ 10 years of age. Analysis was unable to detect an association between the number of reported penile-genital penetrative events and definitive genital findings. Eighty-seven percent of victims who provided a history of ≤ 10 penetrative events had no definitive evidence of penetration. A history of bleeding with abuse was more than twice as likely for subjects with definitive findings. Children ≤ 10 years of age were twice as likely to report ≤ 10 penetrative events, although none had definitive findings on examination. Most victims who reported repetitive penile-genital contact that involved some degree of perceived penetration had no definitive evidence of penetration on examination of the hymen. Similar results were seen for victims of repetitive assaults involving perceived penetration over long periods of time, as well as victims with a history of consensual sex.

Berkoff, M. C., Zolotor, A. J., Makoroff, K. L., Thackeray, J. D., Shapiro, R. A., & Runyan, D. K. (2008). [Has this prepubertal girl been sexually abused?](#) *JAMA*, 300(23), 2779-2792.

Many clinicians expect that a history of penile-vaginal penetration will be associated with examination findings of penetrating trauma. A retrospective case review of 36 pregnant adolescent girls who presented for sexual abuse evaluations was performed to determine the presence or absence of genital findings that indicate penetrating trauma. Historical information and photograph

documentation were reviewed. Only 2 of the 36 subjects had definitive findings of penetration. This study may be helpful in assisting clinicians and juries to understand that vaginal penetration generally does not result in observable evidence of healed injury to perihymenal tissues.

Kellogg, N. D., Menard, S. W., & Santos, A. (2004). Genital anatomy in pregnant adolescents: “normal” does not mean “nothing happened”. *Pediatrics*, *113*(1), e67-e69.

Heger, A., Ticson, L., Velasquez, O., & Bernier, R. (2002). Children referred for possible sexual abuse: Medical findings in 2384 children. *Child Abuse & Neglect*, *26*(6-7), 645-659.

Heger, A. H., Ticson, L., Guerra, L., Lister, J., Zaragoza, T., McConnell, G., & Morahan, M. (2002). Appearance of the genitalia in girls selected for nonabuse: Review of hymenal morphology and nonspecific findings. *Journal of Pediatric and Adolescent Gynecology*, *15*(1), 27-35.

Study Objective: To review all existing studies of genital anatomy in girls selected for nonabuse, clarify terminology used to describe hymenal morphology and nonspecific findings, and test consensus terminology in the reevaluation of hymenal morphology and nonspecific findings in 147 premenarchal girls selected for nonabuse. Over six months, the authors identified and evaluated 147 premenarchal girls without history of sexual abuse who were referred for gynecological examination. Parents and patients were screened for possible abuse or significant past medical or behavioral history, and each girl was interviewed and then received a complete examination including a genital examination documented by colposcopy with both 35 mm camera and video capabilities. Using established terminology each case was then independently reviewed and hymenal morphology and nonspecific findings documented. The study population consisted of 147 premenarchal girls; 76.9% were Hispanic, 12.3% African-American, and 10.3% Caucasian. Subjects had a mean age of 63 months (+/- 38). Hymenal configurations included: annular (concentric) 53%, crescentic (posterior rim) 29.2%, sleeve-like (redundant) 14.9%, septate 2%, and other (imperforate, cribriform) < 1%. Nonspecific findings included peri-hymenal bands, 91.8%; longitudinal intravaginal ridges, 93.8%; hymenal tags, 3.4%; hymenal bumps/mounds, 34%; linea vestibularis, 19%; ventral hymenal cleft/notch at 12 o'clock in 79% of annular or redundant hymens; ventral cleft/notch not at 12 o'clock, 19%; failure of midline fusion, 0.6%; hymenal opening size > 4 mm, 30.6%; erythema, 48.9%; change in vascularity, 37.4%; labial

adhesions, 15.6%; posterior hymenal notch/cleft (partial), 18.3%; posterior notch/cleft (complete), 0%; posterior hymenal concavity or angularity, 29.5%. In addition, each case was assessed for the presence of a thickened (45.5%) or irregular (51.7%) and narrowed (22.4%) hymenal edge. Each case was also reviewed for exposed intravaginal anatomy (93%). The authors concluded that improved techniques and photo documentation have provided examiners with a better understanding of hymenal morphology and that nonspecific genital findings are commonly found in a population of girls selected for nonabuse. A thorough understanding of normal studies and a consistent application of established terminology can prevent the misinterpretation of nonspecific or congenital findings as posttraumatic changes.

Adams, J. A., & Knudson, S. (1996). Genital findings in adolescent girls referred for suspected sexual abuse. *Archives of Pediatrics & Adolescent Medicine*, 150(8), 850-857.

Sexual abuse is a common problem affecting adolescent girls, but the frequency of medical findings in this population has not been specifically described. To describe the frequency of specific genital findings in a group of pubertal girls who had experienced probable or definite sexual abuse. Patient series, medical chart and photograph review. Specialty referral clinic for abused children. Referred sample of female patients, examined between January 1, 1987, and June 30, 1994, with Tanner genital stages 3, 4, or 5, who reported a history of penile-vaginal penetration, had colposcopic photographs taken, and were determined, by means of a previously described classification system, to have experienced probable or definite abuse. The study included 204 girls, aged 9 to 17 years (mean, 13 years); race or ethnicity was Mexican American in 57%, white in 34%, and other in 9%. Abnormal genital findings were documented in 32% of patients overall but were more common when the girls had reported bleeding at the time of the assault (50% vs 26%; $P=.004$, χ^2 analysis), or when the examination occurred within 72 hours of the last episode of abuse (69% vs 26%; $P<.001$, χ^2 analysis). Transections of the hymen were unusual (8%), but notches in the hymen were more common (25%). Normal or nonspecific results of genital examinations are commonly found in adolescents who have been sexually abused, unless the abuse was very recent. Further studies are needed to document the healing of genital injuries in victims of acute assault and the frequency of hymenal findings in nonabused, non-sexually active adolescents.

Adams, J. A., Harper, K., Knudson, S., & Revilla, J. (1994). [Examination findings in legally confirmed child sexual abuse: It's normal to be normal.](#) *Pediatrics*, 94(3), 310-317.

Studies of alleged victims of child sexual abuse vary greatly in the reported frequency of physical findings based on differences in definition of abuse and of "findings." This study was designed to determine the frequency of abnormal findings in a population of children with legal confirmation of sexual abuse, using a standardized classification system for colposcopic photographic findings. Case files and colposcopic photographs of 236 children with perpetrator conviction for sexual abuse, were reviewed. The photos were reviewed blindly by a team member other than the examiner, and specific anatomical findings were noted and classified as normal to abnormal on a scale of 1 to 5. Historical and behavioral information, as well as legal outcome was recorded, and all data entered into a dBase III program. Correlations were sought between abnormal findings and other variables. The mean age of the patients was 9.0 years (range 8 months to 17 years, 11 months), with 63% reporting penile-genital contact. Genital examination findings in girls were normal in 28%, nonspecific in 49%, suspicious in 9%, and abnormal in 14% of cases. Abnormal anal findings were found in only 1% of patients. Using discriminant analysis, the two factors which significantly correlated with the presence of abnormal genital findings in girls were the time since the last incident, and a history of blood being reported at the time of the molest. Abnormal genital findings are not common in sexually abused girls, based on a standardized classification system. More emphasis should be placed on documenting the child's description of the molestation, and educating prosecutors that, for children alleging abuse: "It's normal to be normal."

Adams, J. A., & Wells, R. (1993). Normal versus abnormal genital findings in children: How well do examiners agree?. *Child Abuse & Neglect*, 17(5), 663-675.

In order to determine how well medical examiners agree on the significance of certain anogenital findings in children, preselected colposcopic photographs of the anogenital area of 16 patients were shown to 170 medical examiners (82% pediatricians) who were blinded as to the history on each patient. Findings rated most frequently as being suggestive or indicative of penetrating injury included immediate anal dilatation with no stool present (85%), hymenal transection (84%), marked narrowing of the hymenal rim with notching (81%), and a posterior fourchette scar (75%). The agreement between the participants and the experts on the abnormal cases (mean 81%) was

significantly higher than on the normal cases (mean 71%, $p < .001$) and on genital findings (78%) than on anal findings (63%, $p = .000$). Higher experience level (more cases seen per month) was associated with significantly higher agreement between the participants and the experts on five of eight normal cases and two of four abnormal cases. Use of a colposcope was also associated with higher overall agreement with the experts (74% vs. 44%, $p < .0001$).

Berenson, A. B., Hayes, J. M., Bailey, R. K., Heger, A. H., & Emans, S. J. (1992). [Appearance of the hymen in prepubertal girls](#). *Pediatrics*, 89(3), 387-394.

The recent increase in requests for genital examinations in girls who may have been sexually abused has necessitated detailed information not previously available on normal anatomy of the prepubertal girl. This study was undertaken to document the genital anatomy of 211 girls between the ages of 1 month and 7 years who presented for well child care or nongynecologic complaints and who had no history of sexual abuse. Each child's genitalia was examined and photographed, with findings reported reflecting those observed photographically. The study population consisted of 36% blacks, 33.6% white non-Hispanics, 29.9% Hispanics, and 0.5% Asians. Subjects had a mean age of 21 ± 20.6 (SD) months. Extensive labial agglutination sufficient to obscure the hymen was noted in 5% (10/211) and partial agglutination in an additional 17% (35/211). A significant difference was noted in hymenal configuration by age, with a fimbriated hymen the most common type (46%) in infants aged 12 months or younger and a crescentic hymen the most common (51%) in girls older than 24 months ($P \leq .001$). No significant difference was noted in hymen configuration by race. Hymenal bumps (mounds) were observed in 7%, hymenal tags in 3%, vestibular bands in 98%, longitudinal intravaginal ridges in 25%, and external ridges in 15% of subjects in whom the anatomy under study could be visualized. Hymenal notches (clefts) occurred superiorly and laterally on the hymenal rim but none were found inferiorly on the lower half of the hymen. A narrow rounded hymenal ring with a transection was observed in only 1 (0.5%) of 201 subjects and was not considered a normal finding. Transverse hymenal openings measured only in annular and crescentic hymens had a mean which ranged from 2.5 ± 0.8 to 3.6 ± 1.2 mm and varied significantly with age ($P = .003$). Normal hymenal findings must be recognized by medical professionals so that posttraumatic findings can be diagnosed appropriately.

Muram, D. (1989). Child sexual abuse: Relationship between sexual acts and genital findings. *Child Abuse & Neglect*, 13(2), 211-216.

A comparison was made between the findings observed during the examination of female victims of sexual abuse with the sexual acts to which the perpetrator confessed to have performed. In Shelby County, TN, during the calendar years 1985–1987, 30 individuals confessed to have sexually assaulted 31 girls. The mean age of the girls was 9.1 years, and that of the offenders was 30 years. In 18 of the 31 cases the offender admitted to vaginal penetration. Specific findings were observed in 11 of these 18 (61%) girls, compared with only 3 of 13 (23%) girls when penetration was denied. Although specific findings were more commonly observed when the perpetrator admitted to vaginal penetration, in 7 of 18 girls (39%) the examiner described normal appearing genitalia (n = 2), or nonspecific abnormalities only (n = 5). The author concludes that all complaints of sexual abuse must be considered potentially valid and should be investigated further, even if the physical examination fails to detect any abnormalities.

Physical abuse

Rolfes, M. C., Deyle, D. R., King, K. S., Hand, J. L., Graff, A. H., & Derauf, C. (2019). [Fracture incidence in Ehlers-Danlos syndrome—A population-based case-control study](#). *Child Abuse & Neglect, 91*, 95-101.

Background: The differential diagnosis of non-accidental injury during childhood includes medical conditions that predispose to skeletal fragility. Ehlers-Danlos syndrome (EDS) has been proposed as one such condition despite little objective evidence in the medical literature. **Objective:** To investigate if EDS causes increased bone fragility during infancy and childhood. **Participants and setting:** Residents of an 8-county region in southern Minnesota using the Rochester Epidemiology Project (REP) medical records-linkage system. **Methods:** This retrospective, population-based, case-control study identified subjects with EDS from 1976 to 2015 who had complete records for at least their first year of life. Validity of diagnosis was ascertained using the 2017 International Classification of the Ehlers-Danlos Syndromes. Records were reviewed for fracture diagnoses that were characterized by age, location, type and mechanism. **Results:** Of 219 potential cases, 21 had complete records for the first year of life and sufficient evidence in the medical record to support an EDS diagnosis. Of these 21, there were 14 hypermobile, 2 classical, 4 vascular, and 1 arthrochalasia EDS subtypes. 11 of 21 EDS cases (52.4%) and 15 of 63 controls (23.8%) had one or more fractures during childhood. No fractures were identified in the first year of life. Comparing cases to controls, EDS was associated with having any fractures during childhood with an odds ratio of 3.4 (95% CI: 1.20–9.66). **Conclusions:** We found no evidence that infants with common forms of EDS are predisposed to more frequent fractures. Ambulatory subjects with these EDS subtypes may have a higher incidence of fractures during childhood.

Paine, C. W., & Wood, J. N. (2018). [Skeletal surveys in young, injured children: A systematic review](#). *Child Abuse & Neglect, 76*, 237-249.

Skeletal surveys (SSs) have been identified as a key component of the evaluation for suspected abuse in young children, but variability in SS utilization has been reported. Thus, we aimed to describe the utilization patterns, yield, and risks of obtaining SS in young children through a systematic literature review. We searched PubMed/MEDLINE and CINAHL databases for articles

published between 1990 and 2016 on SS. We calculated study-specific percentages of SS utilization and detection of occult fractures and examined the likelihoods that patient characteristics predict SS utilization and detection of occult fractures. Data from 32 articles represents 64,983 children < 60 months old. SS utilization was high (85%–100%) in studies of infants evaluated by a child protection team for suspected abuse and/or diagnosed with abuse except in one study of primarily non-pediatric hospitals. Greater variability in SS utilization was observed across studies that included all infants with specific injuries, such as femur fractures (0%-77%), significant head injury (51%-82%), and skull fractures (41%-86%). Minority children and children without private insurance were evaluated with SS more often than white children and children with private insurance despite lack of evidence to support this practice. Among children undergoing SS, occult fractures were frequently detected among infants with significant head injury (23%-34%) and long bone fractures (30%) but were less common in infants with skull fractures (1%-6%). These findings underscore the need for interventions to decrease disparities in SS utilization and standardize SS utilization in infants at high risk of having occult fractures.

Pfeiffer, H., Smith, A., Kemp, A. M., Cowley, L. E., Cheek, J. A., Dalziel, S. R., ... & Oakley, E. (2018). External validation of the PediBIRN clinical prediction rule for abusive head trauma. *Pediatrics*, *141*(5), e20173674.

A 4-variable abusive head trauma (AHT) clinical prediction rule (CPR) for use in the PICU was derived and validated for children <3 years of age by the Pediatric Brain Injury Research Network (PediBIRN). We aimed to externally validate PediBIRN as designed (PICU only) as well as using broader inclusion criteria (admitted children with head injuries). This was a secondary analysis of a prospective multicenter study of pediatric head injuries at 5 Australian and New Zealand tertiary pediatric centers. Possible AHT was identified by clinician suspicion, epidemiology codes, or a high-risk group (<3 years of age, admitted, abnormal neuroimaging results). At 1 center, we additionally reviewed head injuries in the forensic database. We designated patients as positive for AHT, negative for AHT, or having indeterminate outcome after multidisciplinary review and applied the PediBIRN CPR, blinded to outcome, to PICU admissions only, and any head injury admissions. CPR accuracy was calculated by using 95% confidence intervals. One hundred and forty-one patients were admitted with abnormal neuroimaging results. Twenty-eight (20%) were positive for AHT, 94 (67%) were negative for AHT, and 19 (13%) had indeterminate outcome.

Excluding indeterminate cases, in the PICU (n = 28), the CPR was 100% (75%–100%) sensitive and 11% (0%–48%) specific; in all admitted patients (n = 141), sensitivity was 96% (82%–100%) and specificity of 43% (32%–53%). This validation revealed high sensitivity and low specificity for PICU patients. Specificity was improved but moderate in a broader group of admitted head injury patients.

Puls, H. T., Anderst, J. D., Bettenhausen, J. L., Masonbrink, A., Markham, J. L., Plencner, L., ... & Hall, M. (2018). [Potential opportunities for prevention or earlier diagnosis of child physical abuse in the inpatient setting](#). *Hospital Pediatrics*, 8(2), 81-88.

The objective was to compare rates of previous inpatient visits among children hospitalized with child physical abuse (CPA) with controls as well as between individual abuse types. In this study, we used the Pediatric Health Information System administrative database of 44 children's hospitals. Children, 6 years of age hospitalized with CPA between January 1, 2011, and September 30, 2015, were identified by discharge codes and propensity matched to accidental injury controls. Rates for previous visit types were calculated per 10 000 months of life. χ^2 and Poisson regression were used to compare proportions and rates. There were 5425 children hospitalized for CPA. Of abuse and accident cases, 13.1% and 13.2% had a previous inpatient visit, respectively. At previous visits, abused children had higher rates of fractures (rate ratio [RR] 5 3.0 times; P 5 .018), head injuries (RR 5 3.5 times; P 5 .005), symptoms concerning for occult abusive head trauma (AHT) (eg, isolated vomiting, seizures, brief resolved unexplained events) (RR 5 1.4 times; P 5 .054), and perinatal conditions (eg, prematurity) (RR 5 1.3 times; P 5 .014) compared with controls. Head injuries and symptoms concerning for occult AHT also more frequently preceded cases of AHT compared with other types of abuse (both P .001). Infants hospitalized with perinatal-related conditions, symptoms concerning for occult AHT, and injuries are inpatient populations who may benefit from abuse prevention efforts and/or risk assessments. Head injuries and symptoms concerning for occult AHT (eg, isolated vomiting, seizures, and brief resolved unexplained events) may represent missed opportunities to diagnose AHT in the inpatient setting; however, this requires further study.

Riney, L. C., Frey, T. M., Fain, E. T., Duma, E. M., Bennett, B. L., & Kurowski, E. M. (2018). [Standardizing the evaluation of nonaccidental trauma in a large pediatric emergency department](#). *Pediatrics*, *141*(1), e20171994.

Variability exists in the evaluation of nonaccidental trauma (NAT) in the pediatric emergency department because of misconceptions and individual bias of clinicians. Further maltreatment, injury, and death can ensue if these children are not evaluated appropriately. The implementation of guidelines for NAT evaluation has been successful in decreasing differences in care as influenced by race and ethnicity of the patient and their family. Our Specific, Measurable, Achievable, Realistic, and Timely aim was to increase the percent of patients evaluated in the emergency department for NAT who receive guideline-adherent evaluation from 47% to 80% by December 31, 2016. The team determined key drivers for the project and tested them by using multiple plan-do-study-act cycles. Interventions included construction of a best practice guideline, provider education, integration of the guideline into workflow, and order set construction to support guideline recommendations. Data were compiled from electronic medical records to identify patients <3 years of age evaluated in the pediatric emergency department for suspected NAT based on chart review. Adherence to guideline recommendations for age-specific evaluation (<6, 6–12, and >12–36 months) was tracked over time on statistical process control charts to evaluate the impact of the interventions. A total of 640 encounters had provider concern for NAT and were included in the analysis. Adherence to age-specific guideline recommendations improved from a baseline of 47% to 69%. With our improvement methodology, we successfully increased guideline-adherent evaluation for patients with provider concern for NAT. Education and electronic support at the point of care were key drivers for initial implementation.

Drouineau, M. H., Guenego, E., Sebillé-Rivain, V., Vrignaud, B., Balençon, M., Blanchais, T., ... & Gras-le Guen, C. (2017). Do abused young children feel less pain?. *Child Abuse & Neglect*, *65*, 248-254.

The objective of this study was to investigate whether acute pain in abused children was under recognized by doctors and nurses compared to children evaluated for accidental injuries. We hypothesize that an abused child's reaction to physical pain could be an additional symptom of this challenging diagnosis. For the observational prospective case control study in an emergency department, children were eligible when: younger than six years old, the reported trauma occurred

within the previous seven days, the trauma comprised a bone injury or burn, and the child was able to express his or her pain. The case group comprised children for whom the medical team reported their abuse suspicions and supporting information to a court, and whose cases of abuse were subsequently confirmed. The control group consisted of children with a plausible cause for their injury and no obvious signs of abuse. The children were matched according to their age and type of trauma. The pain was assessed by doctors and nurses before analgesic administration using a certified pain scale. Among the 78 included children, pain was significantly less recognized in the abused children vs. the controls (relative risk = 0.63; 95% CI: 0.402–0.986; p = 0.04). We observed a discrepancy between the nurses' and doctors' scores for the pain assessments (Kappa coefficient = 0.59, 95% CI: 0.40–0.77). Our results demonstrate that pain expression in abused children is under recognized by medical staff. They also suggest that abused children may have reduced pain expression after a traumatic event. Paying particular attention to the pain of abused children may also optimize the analgesic treatment. © 2017 Elsevier Ltd. All rights reserved.

Keenan, H. T., Cook, L. J., Olson, L. M., Bardsley, T., & Campbell, K. A. (2017). [Social intuition and social information in physical child abuse evaluation and diagnosis.](#) *Pediatrics*, 140(5).

Poor and minority children with injuries concerning for abuse are evaluated and diagnosed for abuse differentially. We hypothesized that 2 steps in the decision-making process would influence evaluation and diagnosis: social intuition from meeting the family and objective social information associated with child abuse risk. Between 2009 and 2013, 32 child abuse pediatricians (CAPs) submitted 730 child abuse consultations including original medical evaluations and diagnoses. CAPs evaluated and diagnosed each other's cases. Comparisons of evaluations and diagnoses were made by levels of social understanding available to the CAP: meeting the family (social intuition and information), reading the case (social information), and reading the case without social information. Evaluations were compared with a consensus gold standard by using logistic regression modeling adjusting for child and CAP characteristics. Diagnostic categories were compared by level of social understanding and diagnostic certainty by using contingency tables. CAPs without access to social intuition were approximately twice as likely to perform gold standard evaluations for neurotrauma and long bone fracture compared with CAPs who met families. Diagnostic agreement fell from 73.3% (95% confidence interval [CI]: 70.1%–76.5%)

when social information was present to 66.5% (95% CI: 63.1%–70.0%) when social information was restricted. In cases with less certainty, agreement dropped to 51.3% (95% CI: 46.0%–56.7%). Social intuition and information play a role in the physical child abuse decisionmaking process, which may contribute to differential diagnosis. Simple interventions including decision tools, check lists, and peer review may structure evaluations to ensure children’s equal treatment.

Chaiyachati, B. H., Asnes, A. G., Moles, R. L., Schaeffer, P., & Leventhal, J. M. (2016). [Gray cases of child abuse: Investigating factors associated with uncertainty](#). *Child Abuse & Neglect, 51*, 87-92.

Research in child abuse pediatrics has advanced clinicians’ abilities to discriminate abusive from accidental injuries. Less attention, however, has been paid to cases with uncertain diagnoses. These uncertain cases – the “gray” cases between decisions of abuse and not abuse – represent a meaningful challenge in the practice of child abuse pediatricians. In this study, we describe a series of gray cases, representing 17% of 134 consecutive children who were hospitalized at a single pediatric hospital and referred to a child abuse pediatrician for concerns of possible abuse. Gray cases were defined by scores of 3, 4, or 5 on a 7-point clinical judgment scale of the likelihood of abuse. We evaluated details of the case presentation, including incident history, patient medical and developmental histories, family social histories, medical studies, and injuries from the medical record and sought to identify unique and shared characteristics compared with abuse and accidental cases. Overall, the gray cases had incident histories that were ambiguous, medical and social histories that were more similar to abuse cases, and injuries that were similar to accidental injuries. Thus, the lack of clarity in these cases was not attributable to any single element of the incident, history, or injury. Gray cases represent a clinical challenge in child abuse pediatrics and deserve continued attention in research. Published by Elsevier Ltd.

Lindberg, D. M., Beaty, B., Juarez-Colunga, E., Wood, J. N., & Runyan, D. K. (2015). [Testing for abuse in children with sentinel injuries](#). *Pediatrics, 136*(5), 831-838.

Child physical abuse is commonly missed, putting abused children at risk for repeated injury and death. Several so-called sentinel injuries have been suggested to be associated with high rates of abuse, and to imply the need for routine testing for other, occult traumatic injuries. Our objective was to determine rates of abuse evaluation and diagnosis among children evaluated at leading

children's hospitals with these putative sentinel injuries. This is a retrospective secondary analysis of the Pediatric Health Information System database. We identified 30 355 children with putative sentinel injuries. We measured rates of abuse diagnosis and rates of testing commonly used to identify occult injuries. Among all visits for children <24 months old to Pediatric Health Information System hospitals, the rate of abuse diagnosis was 0.17%. Rates of abuse diagnosis for children with at least 1 putative sentinel injury ranged from 3.5% for children <12 months old with burns to 56.1% for children <24 months with rib fractures. Rates of skeletal survey and other testing that can identify occult traumatic injury were highly variable between centers and for different injuries. Several putative sentinel injuries are associated with high rates of physical abuse. Among eligible children with rib fracture(s), abdominal trauma, or intracranial hemorrhage, rates of abuse were more than 20%. Future work is warranted to test whether routine testing for abuse in these children can improve early recognition of abuse.

Flaherty, E. G., Perez-Rossello, J. M., Levine, M. A., Hennrikus, W. L., Christian, C. W., Crawford-Jakubiak, J. E., ... & Esposito, P. W. (2014). [Evaluating children with fractures for child physical abuse](#). *Pediatrics*, 133(2), e477-e489.

Fractures are common injuries caused by child abuse. Although the consequences of failing to diagnose an abusive injury in a child can be grave, incorrectly diagnosing child abuse in a child whose fractures have another etiology can be distressing for a family. The aim of this report is to review recent advances in the understanding of fracture specificity, the mechanism of fractures, and other medical diseases that predispose to fractures in infants and children. This clinical report will aid physicians in developing an evidence-based differential diagnosis and performing the appropriate evaluation when assessing a child with fractures.

Garcia, J. E., Wilksch, P. A., Spring, G., Philp, P., & Dyer, A. (2014). Characterization of digital cameras for reflected ultraviolet photography: Implications for qualitative and quantitative image analysis during forensic examination. *Journal of Forensic Sciences*, 59(1), 117-122.

Reflected ultraviolet imaging techniques allow for the visualization of evidence normally outside the human visible spectrum. Specialized digital cameras possessing extended sensitivity can be used for recording reflected ultraviolet radiation. Currently, there is a lack of standardized methods

for ultraviolet image recording and processing using digital cameras, potentially limiting the implementation and interpretation. A methodology is presented for processing ultraviolet images based on linear responses and the sensitivity of the respective color channels. The methodology is applied to a FujiS3 UVIR camera, and a modified Nikon D70s camera, to reconstruct their respective spectral sensitivity curves between 320 and 400 nm. This method results in images with low noise and high contrast, suitable for qualitative and/or quantitative analysis. The application of this methodology is demonstrated in the recording of latent fingerprints.

Louwers, E. C., Korfage, I. J., Affourtit, M. J., Ruige, M., van den Elzen, A. P., de Koning, H. J., & Moll, H. A. (2014). Accuracy of a screening instrument to identify potential child abuse in emergency departments. *Child Abuse & Neglect*, 38(7), 1275-1281.

Although screening for child abuse at emergency departments (EDs) increases the detection rate of potential child abuse, an accurate instrument is lacking. This study was designed to measure the accuracy of a screening instrument for detection of potential child abuse used in EDs. In a prospective cohort study at three Dutch EDs, a 6-item screening instrument for child abuse, Escape, was completed for each child visiting the ED. The data from the completed Escape instrument was used to calculate sensitivity, specificity, and the positive/negative predictive value per item. The clinical notes and conclusions of the screen instruments of all potentially abused children reported to the hospitals' Child Abuse Teams were collected and reviewed by an expert panel. A logistic regression model was used to evaluate the predictors of potential abuse. Completed Escape instruments were available for 18,275 ED visits. Forty-four of the 420 children with a positive screening result, and 11 of the 17,855 children with a negative result were identified as potentially abused. Sensitivity of the Escape instrument was 0.80 and specificity was 0.98. Univariate logistic regression showed that potentially abused children were significantly more likely to have had an aberrant answer to at least one of the items, OR = 189.8, 95% CI [97.3, 370.4]. Most of the children at high risk for child abuse were detected through screening. The Escape instrument is a useful tool for ED staff to support the identification of those at high risk for child abuse.

Farst, K., Ambadwar, P. B., King, A. J., Bird, T. M., & Robbins, J. M. (2013). Trends in hospitalization rates and severity of injuries from abuse in young children, 1997–2009. *Pediatrics*, *131*(6), e1796-e1802.

To examine trends in incidence of hospitalizations for injury from abuse in young children from 1997 through 2009 and to examine injury severity trends. Cases were identified in the National Inpatient Sample database of the Healthcare Cost and Utilization Project by using *International Classification of Diseases, Ninth Revision, Clinical Modification* codes for child maltreatment and external cause of injury for assault in children aged 0 through 3 years. Incidence was calculated by age, gender, and region. Trends in incidence of hospitalization and injury severity were calculated over time. Hospitalization rates for injury from abuse showed no significant change over the study period, ranging from a low of 2.10 per 10 000 children in 1998 to a high of 3.01 per 10 000 children in 2005 ($P = .755$). Children aged <1 had significantly higher hospitalization rates for injury from abuse (6.01 vs 1.12, $P < .001$) and higher mean injury severity scores compared with children aged 1 to 3 years (12.50, SD = 0.14 vs 8.56, SD = 0.21, $P < .001$). Injury severity scores increased significantly over the study period. No significant change in hospitalization rates for injury from abuse among young children was observed from 1997 to 2009. These results coincide with other reports of stable or modestly increasing rates of serious physical abuse or death in young children but not with reports from child welfare data showing declines in physical abuse during the same period. Diverse sources of data may provide important complementary methods to track child abuse.

Harper, N. S., Eddleman, S., & Lindberg, D. M. (2013). [The utility of follow-up skeletal surveys in child abuse](#). *Pediatrics*, *131*(3), e672-e678.

Follow-up skeletal surveys (FUSS) are performed frequently in cases of possible physical abuse based on the evidence from small retrospective cohorts. Our objective was to determine the proportion of FUSS that identified new information in a large, multicenter population of children with concerns of physical abuse. This was a prospective secondary analysis of an observational study of all children <10 years of age (120 months) who underwent evaluation for possible physical abuse by 20 US child abuse teams. This analysis included all children in whom FUSS was recommended and measured rates of FUSS completion, results of FUSS, and the change in perceived likelihood of abuse before and after FUSS. Among 2890 children enrolled in the

Examining Siblings To Recognize Abuse research network, 2049 underwent skeletal survey and 796 (38.8%) had FUSS. A total of 174 (21.5%) subjects had new information identified by FUSS, including 124 (15.6%) with at least 1 new fracture and 55 (6.9%) with reassuring findings compared with the initial skeletal survey. Among cases with new fractures, the estimated likelihood of abuse increased in 41 (33%) cases, and 51 cases (41%) remained at the maximum likelihood of abuse. FUSS identified new information and affected the perceived likelihood of abuse in a substantial fraction of cases in which it was completed. These data support existing guidelines and, in addition, suggest that FUSS should be considered in cases with lower initial levels of concern for abuse.

Maguire, S. A., Lumb, R. C., Kemp, A. M., Moynihan, S., Bunting, H., Watts, P., & Adams, G. (2013). A systematic review of the differential diagnosis of retinal haemorrhages in children with clinical features associated with child abuse. *Child Abuse Review*, 22(1), 29-43.

Retinal haemorrhages (RH) in a young child suggest child abuse, yet other causes merit consideration. This systematic review addresses non-traumatic causes of RH in children with one or more overlapping clinical features of abuse (bruising, fractures, intracranial haemorrhage). Searching 12 databases (1950–2009) identified 338 studies for review by two reviewers. Inclusion criteria included: children < 15 years examined by an ophthalmologist detailing retinal findings, confirmed organic cause and exclusion of abuse. Exclusion criteria included: diagnosed coagulopathy, ocular mass lesion and post-mortem cases. Twenty included studies identified nine relevant conditions (metabolic diseases, bony dysplasias, bleeding disorders and vascular malformations). Where detailed, the RH were bilateral and involved only one area of the retina (the posterior pole). Among proposed confounders of RH, no child with a cough (100 children) or acute life-threatening event (184 cases) had RH. Just two of 217 children with seizures had posterior pole RH, one unilateral and one bilateral. One cardiopulmonary resuscitation (CPR) study (43 cases) was included where a child with co-existent clotting abnormalities had tiny (bilateral dot) RH after 60 minutes' resuscitation. Child abuse remains the commonest cause of RH in young children, although rarer disorders merit consideration. There are insufficient data to conclude that CPR is a confounder in children with RH. © 2012 John Wiley & Sons, Ltd.

Niederkröthaler, T., Xu, L., Parks, S. E., & Sugerman, D. E. (2013). Descriptive factors of abusive head trauma in young children—United States, 2000–2009. *Child Abuse & Neglect*, 37(7), 446-455.

Abusive head trauma (AHT) is a leading cause of severe injury in maltreated children in the United States. There is little research from nationally representative datasets available to characterize young children who had AHT compared to non-abusive head trauma (NAHT). Using the recent CDC AHT case definition, we performed a retrospective analysis of 2000, 2003, 2006 and 2009 hospitalization data using the Kids' Inpatient Database (KID) from the Healthcare Cost and Utilization Project. Logistic regression was used to compare AHT to NAHT patients <2 years of age. Socio-demographic data and indicators of socioeconomic status (i.e., insurance status and household income), presence of chronic conditions, injury severity (i.e., length of hospital stay and vital status), hospital specialization (i.e., hospital type), hospital region, and season of admission were used as independent variables. A weighted sample of 7,603 AHT and 25,339 NAHT patients was identified. National rates for AHT were 39.8 per 100,000 population for children <1 year and 6.8 per 100,000 population for children 1 year old. Compared to NAHT, children with AHT were more often <1 year of age (adjusted odds ratio [aOR] = 2.66; 95% confidence interval [CI]: 2.35–3.01), male (aOR = 1.10; 95% CI: 1.01–1.20), enrolled in Medicaid (aOR = 2.78; 95% CI: 2.49–3.11), hospitalized longer (aOR = 8.26; 95% CI: 7.24–9.43), died during hospitalization (aOR = 5.12; 95% CI: 4.01–6.53), and seen at children's hospitals (aOR = 1.97; 95% CI: 1.63–2.38) and hospitals outside the Northeast [aOR = 2.65 (95% CI: 2.10–3.33) for the Midwest, 1.90

Sheets, L. K., Leach, M. E., Koszewski, I. J., Lessmeier, A. M., Nugent, M., & Simpson, P. (2013). [Sentinel injuries in infants evaluated for child physical abuse](#). *Pediatrics*, 131(4), 701-707.

Relatively minor abusive injuries can precede severe physical abuse in infants. Our objective was to determine how often abused infants have a previous history of “sentinel” injuries, compared with infants who were not abused. Case-control, retrospective study of 401, 12-month-old infants evaluated for abuse in a hospital-based setting and found to have definite, intermediate concern for, or no abuse after evaluation by the hospital-based Child Protection Team. A sentinel injury was defined as a previous injury reported in the medical history that was suspicious for abuse because the infant could not cruise, or the explanation was implausible. Of the 200 definitely abused infants, 27.5% had a previous sentinel injury compared with 8% of the 100 infants with

intermediate concern for abuse (odds ratio: 4.4, 95% confidence interval: 2.0–9.6; $P < .001$). None of the 101 nonabused infants (controls) had a previous sentinel injury ($P < .001$). The type of sentinel injury in the definitely abused cohort was bruising (80%), intraoral injury (11%), and other injury (7%). Sentinel injuries occurred in early infancy: 66% at < 3 months of age and 95% at or before the age of 7 months. Medical providers were reportedly aware of the sentinel injury in 41.9% of cases. Previous sentinel injuries are common in infants with severe physical abuse and rare in infants evaluated for abuse and found to not be abused. Detection of sentinel injuries with appropriate interventions could prevent many cases of abuse.

Dakil, S. R., Cox, M., Lin, H., & Flores, G. (2012). Physical abuse in US children: Risk factors and deficiencies in referrals to support services. *Journal of Aggression, Maltreatment & Trauma, 21*(5), 555-569.

More than 600,000 U.S. children are reported for physical abuse annually. Risk factors are proposed in the literature, but a comprehensive, national assessment of risk factors and support services has not been conducted. An analysis of national data from the National Child Abuse and Neglect Dataset revealed that domestic violence, parental alcohol and drug use, prior child abuse and neglect, public assistance receipt, and child behavior problems are associated with higher odds of substantiated physical abuse reports, compared to unsubstantiated reports. Most families, however, failed to receive relevant support services for any of these risk factors. Screening by physicians, child protection workers, and others for these risk factors could help identify children at increased risk for physical abuse and inform prevention efforts and support-service provision.

Farrell, C., Rubin, D. M., Downes, K., Dormans, J., & Christian, C. W. (2012). [Symptoms and time to medical care in children with accidental extremity fractures.](#) *Pediatrics, 129*(1), e128-e133.

Delay in seeking medical care is one criterion used to identify victims of abuse. However, typical symptoms of accidental fractures in young children and the time between injury and the seeking of medical care have not been reported. We describe patient and injury characteristics that influence the time from injury to medical care. Parental interviews were conducted for children < 6 years old with accidental extremity fractures. Demographic characteristics, signs and symptoms of the injury, and fracture location and severity were described and examined for their association

with a delay (>8 hours) in seeking medical care. Among 206 children, 69% had upper extremity fractures. The median time to the first medical evaluation was 1 hour, but 21% were seen at >8 hours after injury. Although 91% of children cried after the injury, only 83% were irritable for >30 minutes. Parents observed no external sign of injury in 15% of children, and 12% used the injured extremity normally. However, all parents noted at least 1 sign or symptom. Minority children (odds ratio [OR]: 2.54 [95% confidence interval [CI]: 1.18–5.47), those with lower extremity injuries (OR: 2.23 [95% CI: 1.01–4.90]), those without external signs of injury (OR: 3.40 [95% CI: 1.36–8.51]), and those with continued extremity use (OR: 3.26 [95% CI: 1.22–8.76]) were more likely to delay seeking medical care. Although some children did not manifest all expected responses, no child with an accidental fracture was asymptomatic. Delay in seeking medical care was associated with more subtle signs of injury; however, delays identified in minority patients are unexplained.

Letson, M. M., & Tscholl, J. J. (2012). Bruises, burns, and other blemishes: Diagnostic considerations of physical abuse. *Clinical Pediatric Emergency Medicine, 13*(3), 155-165.

Bruises and burns are often early signs of child physical abuse that, if unrecognized and/or unreported, can lead to additional injuries and, ultimately, poor outcomes. The emergency physician is in the position to recognize signs of abuse, diagnose, treat, and intervene on behalf of the child to help ensure protection from further harm. In children with bruising and burns suspicious for physical abuse, concomitant occult injuries such as fractures, abdominal injury, and brain injury are common and therefore must be considered. This article uses cases to illustrate the approach to cutaneous injury in children and emphasizes the importance of including physical abuse as part of the differential diagnosis in young children with injuries.

Wood, J. N., Medina, S. P., Feudtner, C., Luan, X., Localio, R., Fieldston, E. S., & Rubin, D. M. (2012). [Local macroeconomic trends and hospital admissions for child abuse, 2000–2009](#). *Pediatrics, 130*(2), e358-e364.

To examine the relationship between local macroeconomic indicators and physical abuse admission rates to pediatric hospitals over time. Retrospective study of children admitted to 38 hospitals in the Pediatric Hospital Information System database. Hospital data were linked to unemployment, mortgage delinquency, and foreclosure data for the associated metropolitan

statistical areas. Primary outcomes were admission rates for (1) physical abuse in children <6 years old, (2) non-birth, non-motor vehicle crash-related traumatic brain injury (TBI) in infants <1 year old (which carry high risk for abuse), and (3) all-cause injuries. Poisson fixed-effects regression estimated trends in admission rates and associations between those rates and trends in unemployment, mortgage delinquency, and foreclosure. Between 2000 and 2009, rates of physical abuse and high-risk TBI admissions increased by 0.79% and 3.1% per year, respectively ($P \leq .02$), whereas all-cause injury rates declined by 0.80% per year ($P < .001$). Abuse and high-risk TBI admission rates were associated with the current mortgage delinquency rate and with the change in delinquency and foreclosure rates from the previous year ($P \leq .03$). Neither abuse nor high-risk TBI rates were associated with the current unemployment rate. The all-cause injury rate was negatively associated with unemployment, delinquency, and foreclosure rates ($P \leq .007$). Multicenter hospital data show an increase in pediatric admissions for physical abuse and high-risk TBI during a time of declining all-cause injury rate. Abuse and high-risk TBI admission rates increased in relationship to local mortgage delinquency and foreclosure trends.

Lawson, Z., Nuttall, D., Young, S., Evans, S., Maguire, S., Dunstan, F., & Kemp, A. M. (2011). Which is the preferred image modality for paediatricians when assessing photographs of bruises in children?. *International Journal of Legal Medicine*, 125(6), 825-830.

Images of bruises serve as a clinical record and may facilitate forensic analysis in the assessment of suspected physical child abuse. Currently, only conventional imaging techniques are employed; however, alternative imaging modalities using visible and non-visible light may provide additional information. We sought to determine the image modality preferences of paediatricians and the between-observer agreement therein. Nine paediatricians who work in child protection independently compared five image modalities (conventional colour, conventional grey-scale, cross-Polarised, ultraviolet, and infrared) of four bruises, with a compliance rate of 95%. All images were taken using a standardised set of protocols with Nikon D90 cameras and 105-mm macro-lenses. The paediatricians almost unanimously chose cross-Polarised as their preferred modality for all four bruises when assessing boundary, shape, colour, size, and absence of light reflectance. Conventional colour and grey-scale imaging were typically ranked second and third. Ultraviolet and infrared were consistently ranked in the least two favourable positions. Between-observer agreement on ranking order was high, with coefficients of concordance ranging from 0.76

to 0.96. Combinations of imaging modalities chosen to give the most complete picture of the bruise predominantly consisted of cross-Polarised and conventional (colour and grey-scale). This pilot study demonstrated that clinicians collectively favoured cross-Polarised in addition to conventional imaging. Further studies are required to determine the value of ultraviolet and infrared imaging in the assessment of childhood bruises.

Sittig, J., Uiterwaal, C., Moons, K., Nieuwenhuis, E., & van de Putte, E. (2011). [Child abuse inventory at emergency rooms: CHAIN-ER rationale and design](#). *BMC Pediatrics*, *11*(1), 91.

Child abuse and neglect is an important international health problem with unacceptable levels of morbidity and mortality. Although maltreatment as a cause of injury is estimated to be only 1% or less of the injured children attending the emergency room, the consequences of both missed child abuse cases and wrong suspicions are substantial. Therefore, the accuracy of ongoing detection at emergency rooms by health care professionals is highly important. Internationally, several diagnostic instruments or strategies for child abuse detection are used at emergency rooms, but their diagnostic value is still unknown. The aim of the study 'Child Abuse Inventory at Emergency Rooms' (CHAIN-ER) is to assess if active structured inquiry by emergency room staff can accurately detect physical maltreatment in children presenting at emergency rooms with physical injury. CHAIN-ER is a multi-centre, cross-sectional study with 6 months diagnostic follow-up. Five thousand children aged 0-7 presenting with injury at an emergency room will be included. The index test - the SPUTOVAMO-R questionnaire- is to be tested for its diagnostic value against the decision of an expert panel. All SPUTOVAMO-R positives and a 15% random sample of the SPUTOVAMO-R negatives will undergo the same systematic diagnostic work up, which consists of an adequate history being taken by a pediatrician, inquiry with other health care providers by structured questionnaires in order to obtain child abuse predictors, and by additional follow-up information. Eventually, an expert panel (reference test) determines the *true* presence or absence of child abuse. CHAIN-ER will determine both positive and negative predictive value of a child abuse detection instrument used in the emergency room. We mention a benefit of the use of an expert panel and of the use of complete data. Conducting a diagnostic accuracy study on a child abuse detection instrument is also accompanied by scientific hurdles, such as the lack of an

accepted reference standard and potential (non-) response. Notwithstanding these scientific challenges, CHAIN-ER will provide accurate data on the predictive value of SPUTOVAMO-R.

Levin, A. V., Christian, C. W., & Committee on Child Abuse and Neglect. (2010). [The eye examination in the evaluation of child abuse.](#) *Pediatrics*, 126(2), 376-380.

Child abuse can cause injury to any part of the eye. The most common manifestations are retinal hemorrhages (RHs) in infants and young children with abusive head trauma (AHT). Although RHs are an important indicator of possible AHT, they are also found in other conditions. Distinguishing the number, type, location, and pattern of RHs is important in evaluating a differential diagnosis. Eye trauma can be seen in cases of physical abuse or AHT and may prompt referral for ophthalmologic assessment. Physicians have a responsibility to consider abuse in the differential diagnosis of pediatric eye trauma. Identification and documentation of inflicted ocular trauma requires a thorough examination by an ophthalmologist, including indirect ophthalmoscopy, most optimally through a dilated pupil, especially for the evaluation of possible RHs. An eye examination is helpful in detecting abnormalities that can help identify a medical or traumatic etiology for previously well young children who experience unexpected and unexplained mental status changes with no obvious cause, children with head trauma that results in significant intracranial hemorrhage and brain injury, and children with unexplained death.

Rowan, P., Hill, M., Gresham, G. A., Goodall, E., & Moore, T. (2010). The use of infrared aided photography in identification of sites of bruises after evidence of the bruise is absent to the naked eye. *Journal of Forensic and Legal Medicine*, 17(6), 293-297.

The purpose of the study was to determine whether Infrared imaging could play a role in the detection of previous blunt force injury after resolution of skin changes were no longer visible to the human eye. Investigations were performed using an adapted digital camera and the same standard Nikon camera body to photograph the bruises of ten volunteer adult subjects. The same lens was fitted to each camera body and each bruise was photographed until it was no longer possible to identify it with the naked eye. The results of photographing subjects over 6 months demonstrated that the median time the bruises persisted in both groups was approximately between 18 and 19 days. There was no statistically significant difference between groups of bruises

photographed with both the infrared digital camera that had been adapted to capture only infrared light, and with the standard camera which had the same lens fitted to it. The two groups of photographs of bruises imaged at the same time with the two cameras were not significantly different with regard to what skin changes could be detected. The use of the near infrared spectrum, with wavelengths that are longer than the human eye can detect, did not reveal significant evidence of bruising after it had faded from view to both the human eye and to a standard camera.

Leventhal, J. M., Martin, K. D., & Asnes, A. G. (2008). [Incidence of fractures attributable to abuse in young hospitalized children: Results from analysis of a United States database.](#) *Pediatrics*, 122(3), 599-604.

The goal was to assess the proportion of children with fractures attributable to abuse and the incidence of fractures caused by abuse among children <36 months of age who were hospitalized in the United States. We used the Kids' Inpatient Database, which has discharge data on 80% of acute pediatric hospitalizations in the United States, for 3 time periods (1997, 2000, and 2003). Fractures attributable to abuse in children <36 months of age were identified by both an International Classification of Diseases, Ninth Revision, Clinical Modification code for fracture and a diagnosis external-cause-of-injury code for abuse. Weighted estimates of the incidence were calculated. Among children <36 months of age who were hospitalized with fractures, the proportions of cases attributable to abuse were 11.9% in 1997, 11.9% in 2000, and 12.1% in 2003. The proportions of cases attributable to abuse decreased with increasing age; for example, in 2003, the proportions attributable to abuse were 24.9% for children <12 months of age, 7.2% for children 12 to 23 months of age, and 2.9% for children 24 to 35 months of age. In 2003, the incidence of fractures caused by abuse was 15.3 cases per 100000 children <36 months of age. The incidence was 36.1 cases per 100000 among children <12 months of age; this decreased to 4.8 cases per 100000 among 12- to 23-month-old children and 4.8 cases per 100000 among 24- to 35-month-old children. The Kids' Inpatient Database can be used to provide reasonable estimates of the incidence of hospitalization with fractures attributable to child abuse. For children <12 months of age, the incidence was 36.1 cases per 100000, a rate similar to that of inflicted traumatic brain injury (25–32 cases per 100000).

Langlois, N. E. (2007). [The science behind the quest to determine the age of bruises—a review of the English language literature.](#) *Forensic Science, Medicine, and Pathology*, 3(4), 241-251.

Bruises are common injuries that can have medicolegal significance. There are those that maintain it is not possible to estimate the age of bruises. However, appreciation of the biological processes related to the resolution of a bruise suggests that these may provide information regarding the age of a bruise. Potential methods for determining the age of bruises--visual observation, colorimetry, spectrophotometry and histology--are reviewed. The observation of yellow (not orange or brown) indicates a bruise is not recent, but the abilities of visual observation are limited by the physiology of the human eye. Analysis of spectrophotometric data may provide more useful and objective information. Histological examination may be appropriate only in the postmortem situation. The lack of published information limits this as a tool for estimating the age of bruises. It is not known how the wide range of factors that can influence bruise formation and resolution could affect estimation of bruise age.

Hughes, V. K., Ellis, P. S., & Langlois, N. E. I. (2006). Alternative light source (polilight®) illumination with digital image analysis does not assist in determining the age of bruises. *Forensic Science International*, 158(2), 104-107.

The age of a bruise may be of interest to forensic investigators. Previous research has demonstrated that an alternative light source may assist in the visualisation of faint or non-visible bruises. This project aimed to determine if an alternative light source could be utilised to assist investigators estimate the age of a bruise. Forty bruises, sustained from blunt force trauma, were examined from 30 healthy subjects. The age of the bruises ranged from 2 to 231 h (mean = 74.6, median = 69.0). Alternative light source (polilight®) illumination at 415 and 450 nm was used. The black and white photographs obtained were assessed using densitometry. A statistical analysis indicated that there was no correlation between time and the mean densitometry values. The alternative light source used in this study was unable to assist in determining the age of a bruise.

Young, K. L., Jones, J. G., Worthington, T., Simpson, P., & Casey, P. H. (2006). [Forensic laboratory evidence in sexually abused children and adolescents](#). *Archives of Pediatrics & Adolescent Medicine*, 160(6), 585-588.

The objectives were to determine if forensic laboratory evidence could be recovered from alleged sexual abuse victims more than 24 hours after the event and to determine if age or historical factors could be used to determine the need for forensic evidence collections. Retrospective study of hospital records matched with forensic evidence reports from the Arkansas State Crime Laboratory, Little Rock. Setting - The emergency department at Arkansas Children's Hospital, Little Rock. Eighty children (aged <12 years) and adolescents (aged ≥12 years) who presented to the emergency department within 72 hours of an alleged event of sexual abuse or assault with genital contact. Main Outcome Measures -Cases positive for semen were correlated with age of the victim and postevent length of time to presentation to the emergency department. Results - Of the 80 subjects, 16 had positive findings for semen. All 16 subjects who tested positive for semen presented to the emergency department less than 24 hours after the alleged abuse or assault event ($P<.001$). Of the 16 subjects who tested positive, 13 (81%) were adolescents. None of the prepubertal children had semen recovered from any body site; semen was recovered only from clothing or linen in those 3 children. Conclusions - Forensic evidence collections from body sites in child and adolescent rape patients are unlikely to yield positive results for semen (1) more than 24 hours after the event and (2) when taken from prepubertal patients. Consideration should be given to amending guidelines regarding forensic evidence collections in child and adolescent sexual abuse or assault victims. When an allegation of sexual abuse is reported within 72 hours after the event, the American Academy of Pediatrics¹ recommends that children and adolescents be taken immediately to a medical facility so that a physical examination can be performed and forensic evidence collected when appropriate. However, when the likelihood of forensic evidence contributing positively to the diagnosis of sexual abuse is low, the potential emotional harm to the child by evidence collection may be greater than the likelihood of benefit.² The child can perceive the evidence collection as uncomfortable,² frightening, and reminiscent of the abuse. Sedation, when required, also has attendant risks. The goals of this study were to determine the usefulness of forensic collections for semen in child (aged <12 years) and adolescent (aged ≥12 years) sexual assault victims more than 24 hours after the event and to find other factors that may be reliably associated with the presence or absence of semen. The standard of care is to perform forensic

evidence collections if the event occurred less than 72 hours before presentation or if bleeding or recent injury is present. This “72-hour rule” is based on adult data and may not hold true for children.² Some adult data suggest that sperm could be found inside the adult cervix after this period if there was significant trauma, pain, or bleeding, so physician judgment should always be used.³ ⁵ Most published studies involving evidence collection kits in children provide little information as to how often these kits are actually positive for semen, and whether some circumstances warrant omission of forensic specimen collection with confidence that the likelihood of missing evidence is low. Dahlke et al,⁶ in 1977, reported sperm detection in 3% of children younger than 11 years who were raped, compared with 36% of 11- to 14-year-old subjects who were raped.

Honor, G. (2005). Physical abuse: Recognition and reporting. *Journal of Pediatric Health Care*, 19(1), 4-11.

This article provides primary care providers, including pediatric nurse practitioners, with a framework for understanding the dynamics of child abuse, recognizing physical abuse injuries, and reporting concerns of suspected physical abuse to child protective services. Three children die in America every day as a result of child abuse or neglect. Many children who have severe injuries at the time that physical abuse is diagnosed have previously presented with less severe injuries, and physical abuse was overlooked. Physical assessment for children presenting with bruises, bite marks, burns, skeletal injuries, abdominal trauma, and head injuries will be discussed. Prompt recognition and reporting of physical abuse injuries by primary care providers is imperative for the protection of children.

Maguire, S., Mann, M. K., Sibert, J., & Kemp, A. (2005). Can you age bruises accurately in children? A systematic review. *Archives of Disease in Childhood*, 90(2), 187-189.

To investigate whether it is possible to determine the age of a bruise in a child in clinical practice by means of a systematic review. An all language literature search up to 2004. Included studies assessed the age of bruises in live children less than 18 years old. Excluded: review articles, expert opinion, and single case reports. Standardised data extraction and critical appraisal forms were used. Two reviewers independently reviewed studies. Of 167 studies reviewed, three were

included: two studies described colour assessment in vivo and one from photographs. Although the Bariciak *et al* study showed a significant association between red/blue/purple colour and recent bruising and yellow/brown and green with older bruising, both this study and Stephenson and Bialas reported that any colour could be present in fresh, intermediate, and old bruises. Results on yellow colouration were conflicting. Stephenson and Bialas showed yellow colour in 10 bruises only after 24 hours, Carpenter after 48 hours, and Bariciak *et al* noted yellow/green/brown within 48 hours. Stephenson and Bialas reported that red was only seen in those of one week or less. The accuracy with which clinicians correctly aged a bruise to within 24 hours of its occurrence was less than 40%. The accuracy with which they could identify fresh, intermediate, or old bruises was 55–63%. Intra- and inter-observer reliability was poor. A bruise cannot accurately be aged from clinical assessment in vivo or on a photograph. At this point in time the practice of estimating the age of a bruise from its colour has no scientific basis and should be avoided in child protection proceedings.

Zimmerman, S., Makoroff, K., Care, M., Thomas, A., & Shapiro, R. (2005). Utility of follow-up skeletal surveys in suspected child physical abuse evaluations. *Child Abuse & Neglect*, 29(10), 1075-1083.

To evaluate the utility of a follow-up skeletal survey in suspected child physical abuse evaluations. In this prospective study, follow-up skeletal surveys were recommended for 74 children who, after an initial skeletal survey and evaluation by the Child Abuse Team, were suspected victims of physical abuse. The number and location of the fractures were recorded for the initial skeletal survey and for the follow-up skeletal survey in each case. Forty-eight of the 74 (65%) children returned for a follow-up skeletal survey. The follow-up skeletal survey yielded additional information in 22 of 48 patients (46%). In three patients (6%) the additional information changed the outcome of cases; child abuse was ruled out in one of these patients and abuse was confirmed in two cases. In three other patients, the follow-up skeletal survey refuted tentative skeletal findings, but did not change the outcome because of other physical findings. A follow-up skeletal survey identified additional fractures or clarified tentative findings in children who were suspected victims of physical child abuse. The follow-up skeletal survey should be completed on all patients who have an initial skeletal survey performed for suspected physical child abuse and for whom child abuse is still a concern

Committee on Child Abuse and Neglect. (2002). When inflicted skin injuries constitute child abuse. *Pediatrics*, 110(3), 644-645.

Child abuse should be considered as the most likely explanation for inflicted skin injuries if they are nonaccidental and there is any injury beyond temporary reddening of the skin. Minor forms of abuse may lead to severe abuse unless abusive skin injuries are identified and labeled as such and interventions are made.

Stephenson, T., & Bialas, Y. (1996). [Estimation of the age of bruising](#). *Archives of Disease in Childhood*, 74(1), 53-55.

Paediatricians are often requested to give an opinion on the age of a non-accidental bruise. In forensic textbooks, the colour changes which a bruise undergoes with time are not based on research in children. The purpose of this study was to document the sequence of colour changes in photographs taken following accidental bruising in children. Fifty accidental bruises of known age in 23 children were photographed by a medical photographer using the same equipment throughout. The photographs were reviewed by a single observer, blind to the true age of the injury, who described the colours present in the bruise. Red colouration was seen in 15 out of 37 bruises which were less than one week old. Yellow colouration was seen in 10 out of 42 bruises over one day old. Aging of bruises from photographs was much less precise than textbooks imply.

Warner, J. E., & Hansen, D. J. (1994). [The identification and reporting of physical abuse by physicians: A review and implications for research](#). *Child Abuse & Neglect*, 18(1), 11-25.

Identification and reporting of possible cases of child physical abuse are critical precursors to intervention with maltreating families. Professionals from a variety of disciplines are mandated to report suspected cases of child maltreatment. Unfortunately, not all physically abused children are identified or reported. This paper reviews the literature that has examined factors that may influence the identification and reporting of physical abuse by physicians. The literature review is preceded by an overview of the multistep, multi-behavior process of identification and reporting. The factors that may influence identification and reporting are discussed according to their association with the case, physician, or setting. Future directions for research in the area of identification and reporting are suggested throughout the paper.

Thomas, S. A., Rosenfield, N. S., Leventhal, J. M., & Markowitz, R. I. (1991). Long-bone fractures in young children: Distinguishing accidental injuries from child abuse. *Pediatrics*, 88(3), 471-476.

While testifying in child abuse cases, physicians have been frustrated by the lawyer who asks, "Doctor, how did this injury happen?" The medical records and radiographs of 215 children younger than the age of 3 with fractures evaluated by a pediatric service during a 5-year period were retrospectively reviewed in an attempt to elucidate the mechanism of childhood fractures. Based on these reviews, two clinicians and two pediatric radiologists rated the likelihood that the fracture was either accidental or due to child abuse. Long-bone fractures were strongly associated with abuse. This report focuses on the 39 children with either humeral or femoral fractures. Fourteen children had humerus fractures. Eleven were considered to be the result of child abuse, and 3 the result of accidents. The latter 3 were supracondylar elbow fractures in children who fell from a tricycle, a rocking horse, or downstairs. Humerus fractures other than supracondylar fractures were all found to be due to abuse. There were 25 femur fractures. Nine were found to be from abuse, 14 were found to be from accidents, and 2 could not be rated. Sixty percent of femur fractures in infants younger than 1 year of age were due to abuse. Although it is taught that femur fractures in young children are inflicted unless proven otherwise, in this study it was found that femur fractures often are accidental and that the femur can be fractured when the running child trips and falls.

Worlock, P., Stower, M., & Barbor, P. (1986). Patterns of fractures in accidental and non-accidental injury in children: A comparative study. *British Medical Journal (Clinical research ed.)*, 293(6539), 100-102.

The incidence and pattern of fractures in children who had been abused were compared with those of fractures sustained by children of similar ages in whom abuse had been excluded. From 1976 to 1982 there were 35 children with fractures resulting from child abuse, and all were aged under 5. Of the 826 children in the control group, seen from January to June 1981, 85% were aged over 5. Abused children were much more likely to have multiple fractures ($p < 0.001$) and bruising of the head and neck ($p < 0.001$). Fractures of the ribs were common in children who had been abused, and their presence, in the absence of major chest trauma, strongly suggested that abuse was occurring. Injuries to the long bones were invariably spiral or oblique fractures or subperiosteal

new bone formation-both "gripping or twisting" injuries. Spiral fracture of the humeral shaft was significantly more common ($p<0001$) in the group of abused children. Classic metaphysial chip fractures were uncommon. One child in eight aged under 18 months who sustains a fracture may be a victim of child abuse.

Other

Sagalowsky, S. T., Pahalyants, V., Roskind, C. G., & Pusic, M. V. (2020). Building an adaptable resident curriculum for acute pediatric sexual abuse evaluations: a qualitative needs assessment. *Child Abuse & Neglect, 102*, 104386.

Background: Residents are undertrained to perform acute pediatric sexual abuse evaluations. The American Academy of Pediatrics has proposed development of an adaptable child abuse curriculum, though no such curriculum exists. **Objectives:** Our goal was to perform a needs assessment for pediatric residents performing acute sexual abuse evaluations in an emergency department setting, thus laying groundwork for an adaptable curriculum. The objective was to explore pediatric resident training, knowledge, confidence, expectations, learning needs, and educational goals. **Participants and Setting:** We conducted a qualitative exploratory study of pediatric residents, faculty, and program directors at two academic health centers in New York City. **Methods:** Using purposive and convenience sampling, we conducted focus groups and semistructured interviews until saturation of ideas was achieved. Through an iterative process using constructivist grounded theory, themes were organized into a curricular model. **Results:** We conducted 3 resident focus groups (n=21) and 7 interviews with emergency medicine, pediatric, and child abuse faculty. Themes emerged in three categories: barriers (e.g., knowledge deficits), facilitators (e.g., pre-learning), and educational goals. Despite recognizing the importance and increased availability of subspecialists, participants supported gradual autonomy for pediatric residents in the evaluation of suspected sexual abuse, with a goal of independent competency in history and examination skills, and supervised competency of forensic evidence collection. **Conclusions:** Our data support a multimodal, blended curriculum for the acute sexual abuse evaluation, including: (1) asynchronous pre-learning; (2) live workshops; (3) reference tools; and (4) modeled clinical experiences. Our proposed curricular model may be utilized by a variety of frontline clinicians.

Silliman Cohen, R. I., & Adlin Bosk, E. (2020). Vulnerable youth and the COVID-19 pandemic. *Pediatrics*, Online ahead of print. doi: 10.1542/peds.2020-1306

Bradbury-Jones, C., Isham, L., Morris, A. J., & Taylor, J. (2019). [The “neglected” relationship between child maltreatment and oral health? An international scoping review of research. *Trauma, Violence, & Abuse*, <https://doi.org/10.1177/1524838019841598>](https://doi.org/10.1177/1524838019841598)

Globally, the oral health needs of children who have, or are suspected of having, experienced abuse or neglect has become a focus of concern. It is thus valuable and timely to map the contemporary nature of the research landscape in this expanding field. This review reports the findings of a scoping review of the international empirical literature. The aim was to explore the relationship between child maltreatment and oral health and how this complex issue is addressed in contemporary dental, health, and social work practice. The review identified 68 papers, analysis of which identified three themes: (1) There is a relationship between poor oral health and child maltreatment that is well evidenced but conceptually underdeveloped. (2) There are discrepancies between the knowledge of members of the dental team about child maltreatment and their confidence and aptitude to identify and report child protection concerns. (3) There are areas of local-level policy and practice development that seek to improve working relationships between dentists and health and social work practitioners; however, there is widespread evidence that the oral health needs of this group of vulnerable children are not consistently met. To orientate critical discussion and planning for future research and practice, we present the Patterns, Advances, Gaps, Evidence for practice and Research recommendations (PAGER) framework. The review’s findings are likely to be of interest to researchers, practitioners, and policy makers working across dentistry, health and social work.

Cross, T. P., & Schmitt, T. (2019). Forensic medical results and law enforcement actions following sexual assault: A comparison of child, adolescent and adult cases. *Child Abuse & Neglect*, *93*, 103-110.

Background: In sexual assault cases, little research has examined differences in forensic medical findings and law enforcement response by victim age across the entire age range. Objective: This study addressed this gap by comparing four victim age groups: adults, adolescents over the age of consent, adolescents under the age of consent, and children under 12. Participants and setting: Cases were randomly sampled from a statewide database of medical reports on sexual assault examinations conducted in hospital emergency departments, including only cases reported to law enforcement (N=563). Methods: Data were combined from a medical report database, from coding

of medical documentation and crime laboratory reports, and from case data provided by law enforcement. Results: Rates for both younger and older adolescent victims and adult victims were comparable, with no statistically significant differences on most variables: penetration, perpetrator use of force, non-genital and genital injuries, presence of biological evidence, generating assailant DNA profiles, DNA match to suspect, hits in the FBI's DNA database, and law enforcement unfounding (i.e., determining allegations to be false or baseless). Child victims were significantly less likely to have a non-genital injury, and their cases were significantly more likely to be founded by law enforcement. Arrests were significantly more likely when victims were under the age of consent. Conclusions: Despite significant differences by victim age, similarity between adolescent and adult cases was substantial. Both younger and older adolescents may be at higher risk of physical violence during sexual assault than previously recognized, and need greater attention in response systems.

Stavas, N., Shea, J., Keddem, S., Wood, J., Orji, W., Cullen, C., & Scribano, P. (2018). Perceptions of caregivers and adolescents of the use of telemedicine for the child sexual abuse examination. *Child Abuse & Neglect*, 85, 47-57.

Childhood sexual abuse is a common cause of morbidity and mortality. All victims should receive a timely comprehensive medical exam. Currently there is a critical shortage of child abuse pediatricians who can complete the comprehensive child sexual abuse examination. Telemedicine has emerged as an innovative way to provide subspecialty care to this population. Despite the growing popularity of telemedicine, no literature exists describing patient and caregiver perceptions of telemedicine for this sensitive exam. The objective was to explore caregiver and adolescent perspectives of the use of telemedicine for the child sexual abuse examination and discover factors that drive satisfaction with the technology. The sample included caregivers and adolescents who presented for a child sexual abuse medical evaluation at our county's child advocacy center. We completed semi structured interviews of 17 caregivers and 10 adolescents. Guided by the Technology Acceptance Model interviews assessed perceptions about: general feelings with the exam, prior use of technology, feelings about telemedicine, and role of the medical team. Interviews were audio-recorded, transcribed, coded and analyzed using content analysis with constant comparative coding. Recruitment ended when thematic saturation was reached. There was an overwhelming positive response to telemedicine. Participants reported

having a good experience with telemedicine regardless of severity of sexual abuse or prior experience with technology. Behaviors that helped patients and caregivers feel comfortable included a clear explanation from the medical team and professionalism demonstrated by those using the telemedicine system. Telemedicine was widely accepted by adolescents and caregivers when used for the child sexual abuse examination.

Crawford-Jakubiak, J. E., Alderman, E. M., Leventhal, J. M., & Committee on Child Abuse and Neglect. (2017). [Care of the adolescent after an acute sexual assault](#). *Pediatrics*, *139*(3), e20164243.

Sexual violence is a broad term that encompasses a wide range of sexual victimizations. Since the American Academy of Pediatrics published its last policy statement on sexual assault in 2008, additional information and data have emerged about sexual violence affecting adolescents and the treatment and management of the adolescent who has been a victim of sexual assault. This report provides new information to update physicians and focuses on the acute assessment and care of adolescent victims who have experienced a recent sexual assault. Follow-up of the acute assault, as well as prevention of sexual assault, are also discussed.

Dias, M. S., Boehmer, S., Johnston-Walsh, L., & Levi, B. H. (2015). Defining ‘reasonable medical certainty’ in court: What does it mean to medical experts in child abuse cases?. *Child Abuse & Neglect*, *50*, 218-227.

Physicians and others who provide expert testimony in court cases involving alleged child abuse may be instructed to state their conclusions within a ‘reasonable medical certainty’ (RMC). However, neither judges nor jurors knows what degree of probability constitutes RMC for a given expert, nor whether different experts use different standards to formulate their opinions. We sought to better understand how experts define RMC in the context of court cases. An email survey was sent to members of six list-serves, representing four specialties, whose members testify in child abuse cases. Respondents were asked to define how RMC corresponded to (1) the numerical probability that abuse occurred, (2) the ordinal probability, and (3) how their determinations relate to common legal standards (‘preponderance of the evidence’, ‘clear and convincing’, and ‘beyond a reasonable doubt’). Participants were also asked how comfortable they were in defining RMC;

whether their definition changed according to the charges or type of proceeding; and how they would apply RMC to several hypothetical cases. The 294 list-serve participants who responded included child abuse pediatricians (46%), forensic pathologists (21%), pediatric neurosurgeons (15%), pediatric ophthalmologists (12%), and others (6%). Though 95% of respondents had testified in court, only 45% had received training in the definition of RMC. Only 37% were comfortable defining RMC. Although many responses were highly clustered and paired comparisons showed that 95% of participants' responses were internally consistent, there was variability in respondents' definitions of RMC. There is some variability in how child abuse expert witnesses define and use the term RMC; we provide suggestions about how to more accurately and transparently define RMC to ensure justice in these cases. © 2015 Elsevier Ltd. All rights reserved.

Golding, J. M., Wasarhaley, N. E., Lynch, K. R., Lippert, A., & Magyarics, C. L. (2015). [Improving the credibility of child sexual assault victims in court: The impact of a sexual assault nurse examiner.](#) *Behavioral Sciences & the Law*, 33(4), 493-507.

The present study investigated the influence of a sexual assault nurse examiner's (SANE's) testimony on mock juror perceptions of a child or adolescent victim of child sexual assault. Community members (N = 252, 156 females) read a fictional criminal trial summary of a child sexual assault case in which the victim was 6 or 15 years old and the prosecution presented medical testimony from a SANE or a traditional registered nurse (RN), or did not present medical testimony. Mock jurors were more likely to render guilty verdicts when a SANE testified compared with the other two testimony conditions. In addition, pro-victim judgments (e.g., sympathy toward the victim) and negative defendant judgments (e.g., anger toward the defendant) mediated this relation. Finally, cognitive network representations of the case demonstrated that the RN and no-medical-testimony groups were similar and the SANE group was distinct from the other two conditions. We discuss these results in terms of the implications of SANE testimony in child sexual assault court cases. © 2015 John Wiley & Sons, Ltd.

Jordan, K. S., & Moore-Nadler, M. (2014). [Children at risk of maltreatment: identification and intervention in the emergency department](#). *Advanced Emergency Nursing Journal*, 36(1), 97-106.

Child maltreatment is a leading cause of pediatric morbidity and mortality, described as one of the greatest threats facing the health, welfare, and social well-being of children in the United States (U.S. Department of Health and Human Services, 2012). Despite mandatory reporting laws, the poignant reality is that this public health problem is significantly underrecognized and underreported by health care providers. The purpose of this project was to implement a series of strategies in a pediatric emergency department to identify children who are at risk of maltreatment and initiate interventions to ensure their safety and protection before a devastating outcome occurs. The results of this project support the implementation of nursing education, a screening program for risk of child maltreatment, and collaboration with interdisciplinary stakeholders to achieve best practice in emergency medicine. Key words: child abuse and neglect, child maltreatment, child maltreatment prevention, child maltreatment screening, interdisciplinary child maltreatment team, quality improvement, mandatory reporting of child maltreatment

Knox, M. S., Pelletier, H., & Vieth, V. (2014). Effects of medical student training in child advocacy and child abuse prevention and intervention. *Psychological Trauma: Theory, Research, Practice, and Policy*, 6(2), 129.

The Child Advocacy Studies Training (CAST) program was developed by the National Child Protection Training Center to educate future professionals to more effectively prevent, identify, and respond to child maltreatment. The program has been implemented nationally in over 20 colleges and universities. This pilot study examines the effectiveness of the first implementation of CAST in a medical school. Results indicate that medical students' self-reported preparedness to identify signs of child maltreatment, to report a case of suspected child maltreatment, to recommend or secure needed services for a maltreated child, and likelihood to report suspected child maltreatment if they suspected but were not sure about it were significantly improved after completing CAST. The implications of this study may have a profound impact on identifying and potentially decreasing child maltreatment. (PsycINFO Database Record © 2013 APA, all rights reserved)

McGrego, K., Gautam, J., Glover, M., & Jülich, S. (2013). Health care and female survivors of childhood sexual abuse: Health professionals' perspectives. *Journal of Child Sexual Abuse, 22*(6), 761-775.

The present study explored health professionals' experiences with adult survivors of child sexual abuse in New Zealand. Face-to-face, semistructured interviews of up to an hour took place with 13 health professionals. The participants were asked about training, screening practices, their response to disclosures, and advice to other health professionals. A model—transition to ethical practice—emerged from the data, where delivering more sensitive health care to child sexual abuse survivors sits on a continuum from lack of awareness of child sexual abuse to delivery of care where all patients are comfortable. We recommend making sensitive care for all as the standard care of practice and providing training for health professionals on how to deal with disclosures.

Triggle, N. (2013). High profile coverage of abuse puts spotlight on care priorities: Sexual exploitation is a growing safeguarding issue and nurses have a duty to identify the signs, writes Nick Triggle. *Nursing Children and Young People, 25*(9), 8-9.

Harrowing tales of child sex abuse have become all too familiar over the past couple of years. From the mass of allegations against television presenter Jimmy Savile to the high profile court cases about the grooming of young girls in Oxford and Rochdale, it has become apparent that there is a serious problem that needs to be addressed.

Frasier, L. D., Thraen, I., Kaplan, R., & Goede, P. (2012). Development of standardized clinical training cases for diagnosis of sexual abuse using a secure telehealth application. *Child Abuse & Neglect, 36*(2), 149-155.

The training of physicians, nurse examiners, social workers and other health professional on the evidentiary findings of sexual abuse in children is challenging. Our objective was to develop peer reviewed training cases for medical examiners of child sexual abuse, using a secure web based telehealth application (TeleCAM). Sixty de-identified cases developed by 2 child abuse pediatricians, were stratified by availability of information (minimal, moderate, comprehensive) for both positive and negative child sexual abuse findings. These cases were narrowed to a set of 30 cases through an expert peer review process using pediatricians with extensive expertise in the

evaluation of child sexual abuse. A previously studied secure web-based telehealth application TeleCAM which contains a child abuse workflow, was used to develop, disseminate and review cases. A series of Free Margin agreement statistics are used to select those cases with the highest rates of agreement. A final set of 30 cases are stratified equally by availability of information and for both positive and negative findings. Mantel Haenszel Chi-square was used for trend analysis of the ordered categorical variables. The highest degrees of inter-rater reliability was found in cases with moderate to comprehensive information. Cases with minimal data had poor kappa agreement indicating that availability of differing levels and types of information contribute to variability in diagnostic findings. These final cases will be further studied with medical examiners in various settings utilizing TeleCAM as the application for dissemination.

Keeshin, B. R., Cronholm, P. F., & Strawn, J. R. (2012). Physiologic changes associated with violence and abuse exposure: An examination of related medical conditions. *Trauma, Violence, & Abuse, 13*(1), 41-56.

Although the extant evidence is replete with data supporting linkages between exposure to violence or abuse and the subsequent development of medical illnesses, the underlying mechanisms of these relationships are poorly defined and understood. Physiologic changes occurring in violence- or abuse-exposed individuals point to potentially common biological pathways connecting traumatic exposures with medical outcomes. Herein, the evidence describing the long-term physiologic changes in abuse- and violence-exposed populations and associated medical illnesses are reviewed. Current data support that (a) specific neurobiochemical changes are associated with exposure to violence and abuse; (b) several biological pathways have the potential to lead to the development of future illness; and (c) common physiologic mechanisms may moderate the severity, phenomenology, or clinical course of medical illnesses in individuals with histories of exposure to violence or abuse. Importantly, additional work is needed to advance our emerging understanding of the biological mechanisms connecting exposure to violence and abuse and negative health outcomes.

Maier, S. L. (2012). Sexual assault nurse examiners' perceptions of their relationship with doctors, rape victim advocates, police, and prosecutors. *Journal of Interpersonal Violence*, 27(7), 1314-1340.

In response to the negative and inefficient treatment of rape victims by emergency room personnel, the first Sexual Assault Nurse Examiner (SANE) programs began in the late 1970s. While SANEs, doctors, rape victim advocates, police officers and prosecutors work together to ensure the most comprehensive and sensitive care of rape victims, they all have very different roles and objectives. This research explores SANEs' perceptions of their relationships with other professionals who treat or interact with rape victims. Data from interviews with 39 Sexual Assault Nurse Examiners from four East Coast states indicate positive relationships are marked by open communication, respect shown towards SANEs as well as rape victims, and a sense of appreciation among SANEs. On the contrary, negative relationships result when SANEs believe police treat victims poorly, when advocates overstep boundaries and question SANEs about evidence collection or the exam, and when prosecutors fail to properly prepare them to testify during a trial.

Cooper, S. W. (2011). The medical analysis of child sexual abuse images. *Journal of Child Sexual Abuse*, 20(6), 631-642.

Analysis of child sexual abuse images, commonly referred to as pornography, requires a familiarity with the sexual maturation rating of children and an understanding of growth and development parameters. This article explains barriers that exist in working in this area of child abuse, the differences between subjective and objective analyses, methods used in working with this form of contraband, and recommendations that analysts document their findings in a format that allows for verbal descriptions of the images so that the content will be reflected in legal proceedings should there exist an aversion to visual review. Child sexual abuse images are a digital crime scene, and analysis requires a careful approach to assure that all victims may be identified.

De Bellis, M. D., Spratt, E. G., & Hooper, S. R. (2011). [Neurodevelopmental biology associated with childhood sexual abuse](#). *Journal of Child Sexual Abuse*, 20(5), 548-587.

Child maltreatment appears to be the single most preventable cause of mental illness and behavioral dysfunction in the US. There are few published studies examining the developmental and the psychobiological consequences of sexual abuse. There are multiple mechanisms through

which sexual abuse can cause PTSD, activate biological stress response systems, and contribute to adverse brain development. This article will critically review the psychiatric problems associated with maltreatment and the emerging biologic stress system research with a special emphasis on what is known about victimization by sexual abuse.

Esernio-Jensen, D., & Barnes, M. (2011). Nucleic acid amplification testing in suspected child sexual abuse. *Journal of Child Sexual Abuse, 20*(6), 612-621.

The American Academy of Pediatrics recommends that site-specific cultures be obtained, when indicated, for sexually victimized children. Nucleic acid amplification testing is a highly sensitive and specific methodology for identifying sexually transmitted infections. Nucleic acid amplification tests are also less invasive than culture, and this may provide an efficacious alternative for children suspected of being sexually abused.

Finkel, M. A. (2011). Putting it all together. *Journal of Child Sexual Abuse, 20*(6), 643-656.

The most available form of evidence in child sexual abuse cases is what the child has to say about his or her alleged experience. The most difficult skill for clinicians to develop is the "how tos" of talking to children in a developmentally appropriate, nonjudgmental, facilitative, and empathetic manner. This manuscript provides insight into obtaining historical details about a child's experience and guidance regarding how to incorporate those details when formulating a balanced and defensible opinion. The consultative report should be an instrument to explain the presence or absence of physical findings, the significance of symptoms temporally related to sexual contact, and discrepancies between a child's perception of an experience and physical findings.

Finn, C. (2011). Forensic nurses' experiences of receiving child abuse disclosures. *Journal for Specialist in Pediatric Nursing, 16*(4), 252-262.

A child's self-disclosure of abuse is a critical component in initiating intervention to stop abuse and decrease the likelihood of long-term negative outcomes. This study described the context in which child abuse victims disclosed to forensic nurses. Thirty interviews were conducted at the International Forensic Nurses Scientific Assembly 2007 and then analyzed using narrative inquiry

methodology. Five themes emerged: child-friendly environment, building rapport, engaged listening, believing unconditionally, and the potential for false disclosures. their unique stories.

Floyd, R. L., Hirsh, D. A., Greenbaum, V. J., & Simon, H. K. (2011). [Development of a screening tool for pediatric sexual assault may reduce emergency-department visits](#). *Pediatrics*, 128(2), 221-226.

To define the characteristics of a novel screening tool used to identify which prepubertal children should potentially receive an initial evaluation for alleged sexual assault in a nonemergent setting. Electronic medical records were retrospectively reviewed from 2007 to 2008. Visits with a chief complaint or diagnosis of alleged sexual assault for patients aged 12 years or younger were identified. Complete records, those with no evaluation before pediatric emergency-department arrival, and those with child advocacy center follow-up were included. Records were reviewed to answer the following: (1) Did the incident occur in the past 72 hours, and was there oral or genital to genital/anal contact? (2) Was genital or rectal pain, bleeding, discharge, or injury present? (3) Was there concern for the child's safety? (4) Was an unrelated emergency medical condition present? An affirmative response to any of the questions was considered a positive screen (warranting immediate evaluation); all others were considered negative screens. Those who had positive physical examination findings of anogenital trauma or infection, a change in custody, or an emergency medical condition were defined as high risk (having a positive outcome). A total of 163 cases met study criteria; 90 of 163 (55%) patients had positive screens and 73 of 163 (45%) had negative screens. No patients with negative screens were classified as high risk. The screening tool has sensitivity of 100% (95% confidence interval: 93.5– 100.0). This screening tool may be effective for determining which children do not require emergency-department evaluation for alleged sexual assault.

Kar, H. (2011). [Sexual assault in childhood and adolescence](#). In D. N. Vieira (Ed.), *Forensic Medicine - From Old Problems to New Challenges* (pp. 189-214). Intech.

Sege, R., Flaherty, E., Jones, R., Price, L. L., Harris, D., Slora, E., ... & Wasserman, R. (2011). To report or not to report: Examination of the initial primary care management of suspicious childhood injuries. *Academic Pediatrics, 11*(6), 460-466.

This study examined the validity of primary health care providers' (PHCPs) assessment of suspicion that an injury was caused by child abuse and their decision to report suspected child abuse to child protective services (CPS). By using a subsample of injuries drawn from the 15,003 childhood injuries evaluated in the Child Abuse Recognition and Evaluation Study, PHCPs completed telephone interviews concerning a stratified sample (no suspicion of abuse; suspicious but not reported; and suspicious of abuse and reported) of 111 injury visits. Two techniques were used to validate the PHCPs' initial decision: expert review and provider retrospective self-assessment. Five child abuse experts reviewed clinical vignettes created by using data prospectively collected by PHCPs about the patient encounter. The PHCPs' opinions 6 weeks and 6 months after the injury-related visits were elicited and analyzed. PHCPs and experts agreed about the suspicion of abuse in 81% of the cases of physical injury. PHCPs did not report 21% of injuries that experts would have reported. Compared with expert reviewers, PHCPs had a 68% sensitivity and 96% specificity in reporting child abuse. A PHCP's decision to report suspected child abuse to CPS did not reduce the frequency of primary care follow-up in the 6 months after the index visit. PHCPs received information from their state CPS in 70% of the reported cases. Child abuse experts and PHCPs are in general agreement concerning the assessment of suspected child physical abuse, although experts would have reported suspected abuse to CPS more frequently than the PHCPs. Future training should focus on clear guidance for better recognition of injuries that are suspicious for child abuse and state laws that mandate reporting.

Bechtel, K. (2010). [Sexual abuse and sexually transmitted infections in children and adolescents.](#) *Current Opinion in Pediatrics, 22*(1), 94-99.

Sexual abuse is unfortunately common in the United States. The presence of a sexually transmitted infection in a child or adolescent should prompt an evaluation to exclude sexual abuse. The present article reviews the demographics of sexual abuse, the prevalence of specific sexually transmitted infections, such as *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, HIV, human papillomavirus (HPV) and herpes simplex virus (HSV) and which children and adolescents are at highest risk for contracting such infections. The use of nonculture methods, such as nucleic acid amplification tests

(NAATs), to evaluate prepubertal children for *N. gonorrhoeae* or *C. trachomatis*, and the use of HIV post exposure prophylaxis are discussed. Any child or adolescent with a sexually transmitted infection should be evaluated for sexual abuse. Specific infections in prepubertal children, such as *Neisseria gonorrhoeae* or *Chlamydia trachomatis*, are due to abusive contact and should be reported to Child Protective Services. As the modes of transmission of anogenital infections with HPV and HSV are unclear, an evaluation for sexual abuse should be done. Although transmission of HIV after sexual abuse is rare, HIV postexposure prophylaxis must be administered in a timely fashion, and adequate outpatient support provided to facilitate compliance and follow-up.

Hammerschlag, M. R., & Guillén, C. D. (2010). [Medical and legal implications of testing for sexually transmitted infections in children](#). *Clinical Microbiology Reviews*, 23(3), 493-506.

Testing for sexually transmitted infections (STIs) in children presents a number of problems for the practitioner that are not usually faced when testing adults for the same infections. The identification of an STI in a child can have, in addition to medical implications, serious legal implications. The presence of an STI is often used to support the presence or allegations of sexual abuse, and conversely, the identification of an STI in a child will prompt an investigation of possible abuse. The purpose of this paper is to review the epidemiology of child sexual abuse, including the epidemiology of major STIs including *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, syphilis, herpes simplex virus (HSV), *Trichomonas vaginalis*, and human papillomavirus, and the current recommendations for diagnostic testing in this population.

Sanfilippo, P., Richards, A., & Nichols, H. (2010). Reflected ultraviolet digital photography: The part someone forgot to mention. *Journal of Forensic Identification*, 60(2), 181-198.

Reflected ultraviolet photography has been used to document evidence for many years. However, success was often limited because the reflected light was invisible to the eye and was difficult to focus on the film plane. This article presents a discussion about the difficulties of reflected ultraviolet photography and the use of digital reflected ultraviolet photography with cameras like the Fujifilm camera. The benefit of using a Baader Venus filter in lieu of other barrier filters is also explained. With a more thorough understanding of reflective ultraviolet photography, the forensic photographer should be able to produce better results.

MacLeod, K. J., Marcin, J. P., Boyle, C., Miyamoto, S., Dimand, R. J., & Rogers, K. K. (2009). [Using telemedicine to improve the care delivered to sexually abused children in rural, underserved hospitals](#). *Pediatrics*, *123*(1), 223-228.

We used live telemedicine consultations to assist remote providers in the examination of sexually assaulted children presenting to rural, underserved hospitals. We hypothesized that telemedicine would increase the ability of the rural provider to perform a complete and accurate sexual assault examination. Child abuse experts from a university children's hospital provided 24/7 live telemedicine consultations to clinicians at 2 rural, underserved hospitals. Consultations consisted of videoconferencing to assist in the examination and interpretation of findings during live examinations. Consecutive female patients <18 years of age presenting to the 2 participating hospitals were included. We developed and used an instrument to assess the quality of care and the interventions provided via telemedicine as it related to patient history, physical examination, colposcopic and manual manipulation techniques, interpretation of findings, and treatment plans for victims of child sexual abuse. Data from 42 live telemedicine consultations were analyzed. The mean duration of the consultations was 71 minutes (range: 25–210 minutes). The consultations resulted in changes in interview methods (47%), the use of the multimethod examination technique (86%), and the use of adjunct techniques (40%). There were 9 acute sexual assault telemedicine consults that resulted in changes to the collection of forensic evidence (89%). Rankings of practitioners' skills and the telemedicine consult effectiveness were high, with the majority of cases scoring ≥ 5 on a 7-point Likert scale. The use of telemedicine to assist in the examination of sexually assaulted children presenting to underserved, rural communities results in significant changes in the methods of examination and evidence collection. It is possible that this model of care results in increased quality of care and appropriate forensic evidence collection.

Starling, S. P., Heisler, K. W., Paulson, J. F., & Youmans, E. (2009). Child abuse training and knowledge: A national survey of emergency medicine, family medicine, and pediatric residents and program directors. *Pediatrics*, *123*(4), e595-e602.

The objective of this study was to determine the level of knowledge, comfort, and training related to the medical management of child abuse among pediatrics, emergency medicine, and family medicine residents. Surveys were administered to program directors and third-year residents at 67 residency programs. The resident survey included a 24-item quiz to assess knowledge regarding

the medical management of physical and sexual child abuse. Sites were solicited from members of a network of child abuse physicians practicing at institutions with residency programs. Analyzable surveys were received from 53 program directors and 462 residents. Compared with emergency medicine and family medicine programs, pediatric programs were significantly larger and more likely to have a medical provider specializing in child abuse pediatrics, have faculty primarily responsible for child abuse training, use a written curriculum for child abuse training, and offer an elective rotation in child abuse. Exposure to child abuse training and abused patients was highest for pediatric residents and lowest for family medicine residents. Comfort with managing child abuse cases was lowest among family medicine residents. On the knowledge quiz, pediatric residents significantly outperformed emergency medicine and family medicine residents. Residents with high knowledge scores were significantly more likely to come from larger programs and programs that had a center, provider, or interdisciplinary team that specialized in child abuse pediatrics; had a physician on faculty responsible for child abuse training; used a written curriculum for child abuse training; and had a required rotation in child abuse pediatrics. By analyzing the relationship between program characteristics and residents' child abuse knowledge, we found that pediatric programs provide far more training and resources for child abuse education than emergency medicine and family medicine programs. As leaders, pediatricians must establish the importance of this topic in the pediatric education of residents of all specialties.

Christian, C. W. (2008). [Professional education in child abuse and neglect.](#) *Pediatrics*, 122(Supplement 1), S13-S17.

Physicians have reported feeling that they were not adequately trained to identify and report child abuse. This article reviews the current state of medical education and residency training and the needs of physicians in practice and proposes changes and additions that can be made to improve the ability and confidence of physicians who are faced with the responsibility of keeping children safe.

Miller, T. W., Clark, J., Veltkamp, L. J., Burton, D. C., & Swope, M. (2008). Teleconferencing model for forensic consultation, court testimony, and continuing education. *Behavioral Sciences & the Law*, 26(3), 301-313.

A medical center-based forensic clinic that provides the necessary comprehensive consultation, continuing education, court testimony, and clinical services through an applied model of teleconferencing applications is addressed. Telemedicine technology and services have gained the attention of both legal and clinical practitioners, examining trends and models of health care for underserved populations, and identifying where consultation with a team of professionals may benefit service providers in rural communities. The contribution offered herein provides an understanding of the history of the development of the clinic, a theoretical model that has been applied to a clinical forensic program that employs telepsychiatry services, and the ethical and malpractice liability issues confronted in using teleconferencing services. This model is examined through a child and adolescent forensic evaluation clinic. The goals of this model are offered, as are a number of applications within the broad spectrum of services utilizing telemedicine. Finally, changing patterns are addressed in clinically based health-care delivery for criminal justice, social services, and forensic mental health. Copyright © 2008 John Wiley & Sons, Ltd.

Jenny, C. and the Committee on Child Abuse and Neglect. (2007). Recognizing and responding to medical neglect. *Pediatrics*, 120(6), 1385-1389.

Walsh, W. A., Cross, T. P., Jones, L. M., Simone, M., & Kolko, D. J. (2007). Which sexual abuse victims receive a forensic medical examination? *Child Abuse & Neglect*, 31(10), 1053-1068.

Frazier, L. D., & Makoroff, K. L. (2006). Medical evidence and expert testimony in child sexual abuse. *Juvenile and Family Court Journal*, 57(1), 41-50.

Lincoln, C. A., McBride, P. M., Turbett, G. R., Garbin, C. D., & MacDonald, E. J. (2006). The use of an alternative light source to detect semen in clinical forensic medical practice. *Journal of Clinical Forensic Medicine*, 13(4), 215-218.

One of the primary aims of forensic examination in sexual offences is to detect and recover biological material that will link the offender with the complainant. One potentially valuable method by which trace biological evidence may be identified in other forensic settings is via the use of an Alternate Light Source (ALS). The aim of this study was to determine whether or not there was any potential benefit in using an ALS as an adjunct in sexual assault examinations to aid the detection of forensically relevant areas on the body which are not identifiable on visual inspection for sampling. We present two case reports, which illustrate the potential value of using an ALS in clinical forensic medical practice as an adjunct in sexual assault examinations to detect potentially forensically useful areas of skin to sample for semen. Prior to introducing the ALS into our clinical forensic medical practice, we undertook a number of simple laboratory studies to determine a protocol for its use. Semen is known to fluoresce using an ALS at a wavelength of 450 nm. Although we did not conduct a rigorous scientific evaluation of the technique, we evaluated the use of an ALS to detect semen on a range of inanimate surfaces as well as human skin. On all surfaces, visibility of fluorescence was increased by reduced distance of light source from the surface and increased concentration of semen on the surface, but was not noticeably affected by the angle at which the light source was held in relation to the surface.

Erickson, S. J., Gerstle, M., & Feldstein, S. W. (2005). Brief interventions and motivational interviewing with children, adolescents, and their parents in pediatric health care settings: A review. *Archives of Pediatrics & Adolescent Medicine*, 159(12), 1173-1180.

There is increasing demand for physicians in pediatric settings to address not only the physical but also the psychosocial health of their child and adolescent patients. Brief interventions (BIs), and in particular Motivational interviewing (MI), offer an efficient means of targeting behavioral, developmental, and social problems within the context of pediatric practice. This review addresses the patient-centered care foundation of and empirical support for brief pediatric interventions, including educational and media-based interventions, MI-based prevention and intervention with health risk behaviors, procedural pain control, and adherence to treatment recommendations. In

addition, developmental considerations and future directions for BI research in pediatric practice are summarized.

Foster, P. H., & Whitworth, J. M. (2005). The role of nurses in telemedicine and child abuse. *Computers Informatics Nursing*, 23(3), 127-131.

Telemedicine allowed for imaging and videoconferencing between staff at a medical center hub and registered nurses who performed child abuse examinations at community hospitals. By means of electronic communication and information technology, a network was designed to facilitate the examination of children at distant locations when abuse was suspected. Telemedicine provided for expert consultation, rapid evaluation, response to community needs, and an expanded role for nurses. This anecdotal evaluation explored the experience from the view of the registered nurses and an advanced registered nurse practitioner who participated in the telemedicine network. Findings indicated that nurses went through phases of adjustments while becoming familiar with the information technology, cameras, and setup while focusing on the needs of the children and their own responses. Telemedicine nurses were able to draw upon their clinical backgrounds in caring for children and apply their knowledge and skills when assessing victims of abuse. On the basis of interviews and observation, it was concluded that telecommunication did not interfere with the nurse-patient relationship.

Hailey, D., Ohinmaa, A., & Roine, R. O. (2003). [Recent studies on assessment of telemedicine: Systematic review of study quality and evidence of benefit.](#) Institute of Health Economics.

A systematic review of telemedicine assessments was undertaken, as an extension to earlier reviews, with the intention of providing information for decision makers on health care on the status of this technology. This review indicates that although further useful clinical and economic outcomes data have been obtained for some telemedicine applications, good quality studies are still scarce and generalisability of most assessment findings may be limited.

Mears, C. J., Heflin, A. H., Finkel, M. A., Deblinger, E., & Steer, R. A. (2003). Adolescents' responses to sexual abuse evaluation including the use of video colposcopy. *Journal of Adolescent Health, 33*(1), 18-24.

To examine adolescents' responses to a medical examination, which included the use of video colposcopy, conducted during an investigation of possible child sexual abuse. Girls aged 11 to 18 years, referred for evaluation and treatment of sexual abuse at an academic medical center were eligible to participate. Demographic data and information regarding the alleged sexual abuse event(s) were obtained by medical record review. Prior to the medical examination subjects were assessed regarding: anticipations of the medical examination; level of state anxiety using the State-Trait Anxiety Inventory (STAI); response to stressful situations along the dimensions of information-seeking or information-avoiding using the Miller Behavioral Style Scale (MBSS); and knowledge of reproduction and genital anatomy. Subsequently, a medical examination, which included the use of video colposcopy with a monitor for subject viewing, was completed. The examining physician provided a standardized educational intervention regarding genital anatomy and a discussion about abuse issues and sexually transmitted infections. An exit interview assessed perceptions of the medical examination and video colposcopy and reassessed anxiety using the state portion of the STAI. Follow-up interviews occurred 3 months later during which knowledge of reproduction and genital anatomy was reassessed. Measures were evaluated using paired Student's *t*-tests, McNemar tests for correlated proportions, correlations and independent Student's *t*-tests, as appropriate. Seventy-seven eligible girls participated; 51 returned for follow-up. The mean age of the subjects was 13.5 years (SD 1.4 years). Fifty-one percent of the sample was Caucasian, 29% African-American, 18% Hispanic, and 2% other. Seventy-nine percent of the girls chose to watch the examination on the video monitor. The girls' post-examination perceptions were significantly more positive than their pre-examination anticipations ($p < .001$), even though some aspects continued to be embarrassing, painful, or "scary". Anxiety, as measured by the STAI, significantly decreased from pre- to post-examination ($p < .001$). Pre-examination and post-examination anxiety were negatively associated with pre-examination anticipation and post-examination perceptions, respectively. Information-avoiding coping styles on the MBSS were associated with positive anticipations of the examination, but exhibited a trend toward negative associations with perceptions of video colposcopy. Scores assessing knowledge of the reproductive functions of their bodies at 3 months revealed no significant differences during the

period from pre-examination assessment to three-month follow-up. Teens generally reported that the medical examination, which included the use of video colposcopy, was beneficial. There was a significant reduction in anxiety from pre-examination to post-examination and the girls' feelings about the medical examination were significantly more positive afterwards.

Putnam, F. W. (2003). Ten-year research update review: Child sexual abuse. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(3), 269-278.

The objective was to provide clinicians with current information on prevalence, risk factors, outcomes, treatment, and prevention of child sexual abuse (CSA). To examine the best-documented examples of psychopathology attributable to CSA. Computer literature searches of *Medline* and *PSYCIInfo* for key words. All English-language articles published after 1989 containing empirical data pertaining to CSA were reviewed. CSA constitutes approximately 10% of officially substantiated child maltreatment cases, numbering approximately 88,000 in 2000. Adjusted prevalence rates are 16.8% and 7.9% for adult women and men, respectively. Risk factors include gender, age, disabilities, and parental dysfunction. A range of symptoms and disorders has been associated with CSA, but depression in adults and sexualized behaviors in children are the best-documented outcomes. To date, cognitive-behavioral therapy (CBT) of the child and a nonoffending parent is the most effective treatment. Prevention efforts have focused on child education to increase awareness and home visitation to decrease risk factors. CSA is a significant risk factor for psychopathology, especially depression and substance abuse. Preliminary research indicates that CBT is effective for some symptoms, but longitudinal follow-up and large-scale "effectiveness" studies are needed. Prevention programs have promise, but evaluations to date are limited.

Makoroff, K. L., Brauley, J. L., Brandner, A. M., Myers, P. A., & Shapiro, R. A. (2002). Genital examinations for alleged sexual abuse of prepubertal girls: Findings by pediatric emergency medicine physicians compared with child abuse trained physicians. *Child Abuse & Neglect*, 26(12), 1235-1242.

This study compares abnormal genital examination findings made by pediatric emergency medicine (PEM) physicians to examinations by physicians with training in child sexual abuse in the evaluation of prepubertal girls for suspected sexual abuse. A prospective study was performed

following the genital examination by a PEM physician of prepubertal girls suspected of being sexually abused. A physician with training in child sexual abuse re-examined those girls whose examinations were interpreted as abnormal by the PEM physicians. The findings and interpretations of the PEM physician were then compared to those by the physicians with training in child abuse. Between October 1994 and October 1998, 46 patients diagnosed by PEM physicians with nonacute genital findings indicative of sexual abuse were re-examined by a physician with training in child abuse. The follow-up examinations were done 2 days–16 weeks (mean 2.1 weeks) after the emergency department visit. The physicians with training in child abuse concluded that only eight of these children (17%) showed clear evidence of abuse. Normal findings were noted in 32 children (70%), nonspecific changes were noted in 4 children (9%), and 2 children (4%) had findings that are more commonly seen in abused children than nonabused children but are not diagnostic for abuse (concerning for abuse). There was poor agreement between the pediatric emergency medicine physicians and the physicians with training in child sexual abuse. This study suggests that emergency medicine physicians should consider additional training in this area. In addition, all children with abnormal ED examinations should have follow-up examinations by a child abuse trained physician.

Allard-Dansereau, C., Hébert, M., Tremblay, C., & Bernard-Bonin, A. C. (2001). [Children's response to the medical visit for allegations of sexual abuse: Maternal perceptions and predicting variables.](#) *Child Abuse Review*, 10(3), 210-222.

This study examined maternal perceptions of their child's response to the medical evaluation for alleged sexual abuse. A total of 50 mothers were interviewed 6 months after a visit to a Child Protection Clinic for a medical evaluation of alleged sexual abuse. The mothers answered a questionnaire on their child's reactions to the medical visit. More than 60% of children were perceived as being reassured about physical integrity. The degree of psychological distress was independent of perpetrator's identity and severity of the abuse. Mothers considered that a hypothetical second visit would generate in their child a level of anxiety that increased with perceived intensity of fear of the examination and decreased with perceived kindness of the physician. These results suggest that the physician's behaviour during the medical 'Results suggest

that the physician's behaviour has an influence on the child's degree of distress' evaluation for alleged sexual abuse has an influence on the child's degree of distress that is independent of type and severity of abuse. Copyright © 2001 John Wiley & Sons, Ltd.

Littel, K. (2001). *Sexual assault nurse examiner (SANE) programs: Improving the community response to sexual assault victims*. Washington DC: US Department of Justice, Office of Justice Programs, Office for Victims of Crime.

Palusci, V. J., & Cyrus, T. A. (2001). Reaction to videocolposcopy in the assessment of child sexual abuse. *Child Abuse & Neglect*, 25(11), 1535-1546.

Objective: The purpose of this study was to clinically assess children's reactions to videocolposcopy with real-time observation of magnified anogenital images (VCO), and to evaluate whether these reactions are affected by patient or other characteristics such as response to preparation, disclosure of child sexual abuse (CSA), or examination findings. Method: Consecutive cases of children ages less than 18 years referred to a children's hospital clinic for nonemergent evaluation of suspected CSA during 1997 through 1999 were studied. We noted the child's response with clinical observation before and after videocolposcopy, and used the Genital Examination Distress Scale (GEDS) after evaluation. We compared these responses to patient gender, age, ethnicity, pubertal status, disclosure of child sexual abuse (CSA), and physical examination findings using univariate and regression analyses. Results: Two hundred twenty-seven children (mean age 7.2 years, range 0–17) underwent videocolposcopy, of whom 55.1% disclosed sexual abuse and 17.2% had a positive examination. More than 80% were female, prepubertal, and non-Hispanic White. Most (85%) watched their examination on the monitor and were either cooperative or enthusiastic before and after videocolposcopy. Fewer very young children (ages 0–3 years) or female adolescents (13–17 years) watched the monitor. Summed GEDS scores were strongly correlated with observed responses after the procedure ($p < .01$), and children with CSA disclosure were three times more likely to watch the monitor and five times more likely than those without disclosure to have improved comfort. Other patient characteristics were not significantly associated with patient reaction to VCO. Conclusions: Most children are interested in watching their anogenital examination using magnified real-time images obtained during videocolposcopy and tolerate the procedure well. The GEDS is highly correlated with

subjective clinical observation. While some children may particularly benefit from participating in their examination by using VCO, long-term effects of the evaluation and any relationship of a child's reaction to videocolposcopy with their history of sexual victimization remain to be established. © 2001 Elsevier Science Ltd. All rights reserved.

Socolar, R. R., Fredrickson, D. D., Block, R., Moore, J. K., Tropez-Sims, S., & Whitworth, J. M. (2001). State programs for medical diagnosis of child abuse and neglect: Case studies of five established or fledgling programs. *Child Abuse & Neglect*, 25(4), 441-455.

Objective: To describe the programs for medical diagnosis of child abuse and neglect in three states and efforts to establish state-wide programs in two states. To describe common themes and issues that emerged related to the establishment and maintenance of these programs. Five states were selected as case studies to represent a range of experience and type of function embodied in programs that address medical diagnosis of child abuse and neglect. Individuals knowledgeable about the programs or efforts to establish state-wide programs in their home states described these in detail. Inductive analysis was used to identify themes and issues that emerged across the states studied. Themes emerged in three general areas: funding, services, and training. Findings related to funding were: 1) State funding was vital for initiation of statewide programs; 2) Alliances with other groups with parallel interests were successfully used to garner support for child abuse programs; 3) Services needed to be adequately reimbursed to be sustained; 4) Political climate often affected funding. With regard to services we found: 1) There was no optimal way to organize services, but rather many ways that worked well; 2) It was critical to address local service needs; 3) Provision of standardized quality services was essential. With regard to training: 1) Professional training was an integral part of all statewide programs; 2) New technologies, including televideo, have been explored and implemented to assist in training in statewide programs. Each state has taken a unique approach to programs for the medical diagnosis of child abuse and neglect. However, there are commonalities, particularly among the states that have been successful in establishing and maintaining comprehensive services and/or training.

Stevens-Simon, C., Nelligan, D., Breese, P., Jenny, C., & Douglas, J. M. (2000). [The prevalence of genital human papillomavirus infections in abused and nonabused preadolescent girls](#). *Pediatrics*, 106(4), 645-649.

Objective: To compare the prevalence of genital human papillomavirus (HPV) infections in sexually abused and nonabused preadolescent girls and assess the feasibility of conducting a longitudinal study of the natural history of HPV infection in this population. Consecutively referred, 5- to 12-year-old girls who were evaluated for sexual abuse by a Child Advocacy and Protection Team were invited to participate in the study. During a standard forensic medical examination, 2 specimens for HPV testing were obtained (one by rubbing a Dacron swab over the perineum and the other by lavaging the vagina with phosphate-buffered saline). The specimens were evaluated for HPV DNA by polymerase chain reaction using MY09/11 consensus primers and high-risk (16,18,31,33,35,39,45,51,52, 56,58) and low-risk (6,11,42,43,44) types were detected with a solution hybridization assay, the SHARP Signal System (Digene Diagnostics). The genital area was examined for warts and subclinical, colposcopic evidence of HPV. Participants were invited to return for longitudinal evaluation at 4-month intervals for 2 years. Sexual abuse was confirmed in 29 (72.5%) of the 40 study participants, suspected in 2 (5%), and ruled out in 9 (22.5%). None of the girls had genital warts or abnormal colposcopic findings. HPV DNA was detected in 5 (16%) of the 31 girls with confirmed or suspected sexual abuse (1 with high-risk and 4 with low-risk types) and none of the nonabused girls (Fisher's exact test). Girls who tested positive and negative for HPV did not differ significantly in age or type of abuse. Despite close telephone follow-up and numerous attempts to schedule appointments, none of the participants returned for follow-up. Genital HPV infection is more common among sexually abused than nonsexually abused girls, with the majority of infections not clinically apparent. Because it is so difficult to study the natural history of these infections in abused children, it may be necessary to draw inferences about the long-term sequelae of pediatric HPV infections from longitudinal studies of girls who voluntarily initiate sexual activity soon after menarche.

Britton, H. (1998). Emotional impact of the medical examination for child sexual abuse. *Child Abuse & Neglect*, 22(6), 573-79.

Discusses the importance of research on the emotional impact of the medical examination for child sexual abuse. Summarizes current research; identifies unanswered questions; and proposes a

research agenda to investigate effects of pre-existing factors, medical setting and emotional response, targeting positive and negative outcomes, and emotional response to the examination as an indicator of psychosocial status.

DiPietro, E. K., Runyan, D. K., & Fredrickson, D. D. (1997). Predictors of disclosure during medical evaluation for suspected sexual abuse. *Journal of Child Sexual Abuse*, 6(1), 133-142.

The extent and nature of a child's disclosure of sexual abuse is an important component of the medical diagnosis. This study examined the frequency of disclosure of abuse by (the alleged victim, as well as the child, examiner, and case characteristics that might influence disclosure. One goal was to understand how our medical examination protocol might impede or encourage the child to disclose victimization. All records for 179 children who received an examination for sexual abuse during the period from July 1, 1991 through June 30, 1992 were reviewed. Data were abstracted about demographics, interviewer identity, the alleged acts, the alleged perpetrator, and family characteristics. The overall disclosure rate was 47%. Factors associated with child disclosure were child age, siblings in the home, perpetrator other than a biological parent, alleged oral-genital contact or penetration, previous disclosure, and interview conducted by the physician. The factors significant in regression analysis were: prior disclosure, age greater than four years, and interview by the physician rather than by a social worker or psychologist. The findings related to disclosure to the physician may be confounded by child age. Nevertheless, the findings suggest the need to consider the advantages the physician might bring to the conduct of the sexual abuse interview.

Frasier, L. D. (1997). The pediatrician's role in child abuse interviewing. *Pediatric Annals*, 26(5), 306-311.

The history of sexual abuse that a child gives to the pediatrician may be the single most important factor in determining if a child has been abused. Most children have completely normal anogenital examinations; very rarely is definitive forensic evidence obtained or a sexually transmitted disease discovered. Physicians, in general, are given unique authority and privilege in reporting such hearsay evidence. The pediatrician often is the first professional with whom a child has contact when an allegation of abuse is made. Child protective issues then become paramount. It is

important, therefore, for the physician to have the basic skills and knowledge of the developmentally appropriate approach to interviewing a child. How that interview is preserved and documented is also critically important and will be scrutinized in any legal proceedings. The physician's interview should not replace a skilled forensic interview but be considered a supplement, whose purpose is foremost the health, well-being, and protection of the child.

Steward, M. S., Schmitz, M., Steward, D. S., Joye, N. R., & Reinhart, M. (1995). Children's anticipation of and response to colposcopic examination. *Child Abuse & Neglect, 19*(8), 997-1005.

Just prior to and following general physical and colposcopic anogenital exams, 43 mothers and daughters (3–15 years), referred because of allegations of sexual abuse, were interviewed separately to determine their knowledge of and feelings about the exam. Children were not retraumatized by the examination of their anogenital anatomy. Although poorly prepared for it, children reported medical staff touch to their genitals, anus, and buttocks at a higher rate than touch to all other body locations, 84.5% versus 16%, but did not rate that touch as more painful. Children were significantly less distressed after the exam; mothers were not.

Adams, J. A. (1993). Significance of medical findings in suspected sexual abuse: Moving towards consensus. *Journal of Child Sexual Abuse, 1*(3), 91-99.

Berson, N. L., Herman-Giddens, M. E., & Frothingham, T. E. (1993). Children's perceptions of genital examinations during sexual abuse evaluations. *Child Welfare: Journal of Policy, Practice, and Program, 72*(1), 41-49.

Summarizes experiences of 514 children evaluated for sexual abuse. The experiences of 3 girls, aged 9 yrs, 10 yrs, and 5 yrs 6 mo, illustrate varying responses to medical evaluations. For many children a genital examination can be highly stressful and may trigger memories of the sexual abuse itself. Stress can be reduced by preparing the child for the examination, by giving the child greater control, and by debriefing the child and parents afterward. (PsycINFO Database Record © 2016 APA, all rights reserved)

De Jong, A. R., & Rose, M. (1989). Frequency and significance of physical evidence in legally proven cases of child sexual abuse. *Pediatrics*, 84(6), 1022-1026.

Clinicians have long recognized and attorneys have disputed that physical evidence of injury, sexually transmitted diseases, and seminal fluid are often absent in cases of child sexual abuse. To determine the frequency and significance of physical evidence in legally "proven" felony cases with penetration, a retrospective review of sexual abuse court records was done. A total of 45 randomly selected cases were reviewed; 39 (87%) had resulted in conviction of the perpetrator for felony. Charges of vaginal rape were made in 32 cases, and charges of oral and/or anal sodomy in 23 cases. No significant difference in rate of felony conviction was found in cases with or without physical evidence. Of 32 cases without physical evidence, 30 (94%) resulted in felony convictions, whereas only 9 of 13 cases (69%) with physical evidence resulted in a felony conviction. Multiple variables describing the abuse situation were not shown to affect the legal outcome of the cases. Of cases that resulted in felony convictions, physical evidence was present in only 23% (9 of 39). These results should be helpful for the clinician in counseling the family of the sexual abuse victim and the attorney who prosecutes child sexual abuse cases.

Mosteller, R. P. (1988). [Child sexual abuse and statements for the purpose of medical diagnosis or treatment](#). *North Carolina Law Review*, 67, 257-294.

Hammerschlag, M. R., Cummings, M., Doraiswamy, B., Cox, P., & McCormack, W. M. (1985). [Nonspecific vaginitis following sexual abuse in children](#). *Pediatrics*, 75(6), 1028-1031.

Nonspecific vaginitis, one of the most common causes of vaginitis in adults, is a polymicrobial infection in which vaginal anaerobes act synergistically with *Gardnerella vaginalis*. The diagnosis is made by examination of the vaginal secretions for clue cells, the development of a fishy odor after the addition of 10% KOH to vaginal secretions, and a vaginal pH greater than 4.5. To determine whether nonspecific vaginitis occurs in sexually abused children, we obtained vaginal washes from 31 abused and 23 nonabused children, 2½ to 13 years of age. A child was considered to have definite nonspecific vaginitis if her wash contained both clue cells and odor; she was considered to have possible nonspecific vaginitis if her wash contained either clue cells or odor. We did not use vaginal pH as a diagnostic criterion because the normal range has not been standardized in prepubertal girls. Possible nonspecific vaginitis (odor only) was found in only 1/23

(4%) of nonabused children. This girl was asymptomatic and findings from her examination were normal. Only one of the 31 abused children had possible nonspecific vaginitis (odor) detected at the initial examination, less than 48 hours after the episode of abuse, whereas 4/31 (13%) developed definite, and 4/31 (13%) possible nonspecific vaginitis at the follow-up visit more than seven days after the episode of abuse or rape. Five of these eight girls developed either a new vaginal discharge or dysuria; three were treated with metronidazole with resolution of their symptoms and reversion of the vaginal wash to normal. These findings suggest that nonspecific vaginitis is uncommon in normal children and that it can be acquired after sexual abuse. Nonspecific vaginitis was the most frequent cause of vaginitis in the abused girls in this study. Examination of a vaginal wash for clue cells and odor should be part of the evaluation of sexually abused girls who develop vulvovaginal symptoms.