

Accepted Manuscript

Updated Guidelines for the Medical Assessment and Care of Children Who May Have Been Sexually Abused

Joyce A. Adams, MD, Nancy D. Kellogg, MD, Karen J. Farst, MD, Nancy S. Harper, MD, Vincent J. Palusci, MD, MS, Lori D. Frasier, MD, Carolyn J. Levitt, MD, Robert A. Shapiro, MD, Rebecca L. Moles, MD, Suzanne P. Starling, MD

PII: S1083-3188(15)00030-3

DOI: [10.1016/j.jpag.2015.01.007](https://doi.org/10.1016/j.jpag.2015.01.007)

Reference: PEDADO 1821

To appear in: *Journal of Pediatric and Adolescent Gynecology*

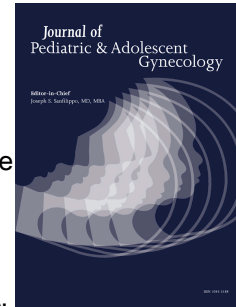
Received Date: 31 October 2014

Revised Date: 23 January 2015

Accepted Date: 30 January 2015

Please cite this article as: Adams JA, Kellogg ND, Farst KJ, Harper NS, Palusci VJ, Frasier LD, Levitt CJ, Shapiro RA, Moles RL, Starling SP, Updated Guidelines for the Medical Assessment and Care of Children Who May Have Been Sexually Abused, *Journal of Pediatric and Adolescent Gynecology* (2015), doi: 10.1016/j.jpag.2015.01.007.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Updated Guidelines for the Medical Assessment and Care of Children
Who May Have Been Sexually Abused

Joyce A. Adams, MD¹, Nancy D. Kellogg, MD², Karen J. Farst, MD³, Nancy S. Harper, MD⁴,
Vincent J. Palusci, MD, MS⁵, Lori D. Frasier, MD⁶, Carolyn J. Levitt, MD⁷, Robert A. Shapiro,
MD⁸, Rebecca L. Moles, MD⁹, Suzanne P. Starling, MD¹⁰

Affiliations:

¹ Department of Pediatrics, University of California, Davis Medical Center, Sacramento, CA

² Department of Pediatrics, University of Texas Health Science Center at San Antonio, San Antonio, TX

³ Department of Pediatrics, University of Arkansas for Medical Sciences, Arkansas Children's Hospital, Little Rock, AR

⁴ Department of Pediatrics, University of Minnesota; University of Minnesota Masonic Children's Hospital, Minneapolis, MN

⁵ Department of Pediatrics, New York University School of Medicine, New York, NY

⁶ Department of Pediatrics, Penn State Milton S. Hershey Children's Hospital, Hershey, PA

⁷ Department of Pediatrics, University of Minnesota; Children's Hospitals and Clinics of Minnesota, St. Paul, MN

⁸ Department of Pediatrics, Cincinnati Children's Hospital Medical Center, Cincinnati Ohio

⁹ Department of Pediatrics, Yale School of Medicine, New Haven, CT

¹⁰ Department of Pediatrics, Eastern Virginia Medical School; Children's Hospital of The King's Daughters, Norfolk, VA

Address correspondence to: Joyce A. Adams, MD, UC Davis Pediatrics, 2516 Stockton Blvd, 3rd Floor, Sacramento, CA 95817, Phone 916-734-3112, email: jadams@ucsd.edu

Financial Support: Midwest Regional Children's Advocacy Center - Office of Juvenile Justice and Delinquency Prevention (DOJ)

Disclaimers: The authors have no conflicts of interest to disclose related to this study.

ACCEPTED MANUSCRIPT

Abstract

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 in this field. Since 2007, when the paper 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 (CDC)¹ and the American Academy of Pediatrics (AAP)² 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.

Keywords: Child sexual abuse, Differential diagnosis, sexually transmitted infections, Expert opinion, Medical history taking, Peer review, Expert testimony

Updated Guidelines for the Medical Assessment and Care of Children Who May Have Been Sexually Abused

Introduction

A set of guidelines and recommendations, published in 2007³ were developed using a process of consensus development after a review of the medical literature available at the time regarding the medical evaluation and interpretation of medical and laboratory findings in children brought for examination for suspected sexual abuse. This paper presents updated guidelines, developed after a review of recently published research and recommendations from the Centers for Disease Control and Prevention (CDC)¹ and the American Academy of Pediatrics (AAP)². The authors searched the medical literature to identify well-designed, unbiased studies published in high-ranking journals that addressed the topic of medical evaluation of suspected child sexual abuse and the interpretation of medical findings. The group reached consensus on the revision of the 2007 guidelines, based on literature critique and review.

Medical History

An accurate and complete history is essential in making the medical diagnosis and determining appropriate treatment of child abuse.⁴ The history includes physical symptoms, emotional/behavioral symptoms, and information about the abuse needed to assess and manage suspected victims of abuse. Obtaining details about the abuse is typically coordinated with a multidisciplinary team (MDT) and may be obtained by a forensic interviewer or a medical professional. Due to differences in purpose and approach, the medical history may differ, yet complement, the forensic interview. For example, a medical history identifying physical

symptoms of painful urination may be directly related to a recent episode of sexual abuse and provide additional information of forensic significance.⁵

The process of obtaining the history from the child and non-offending caregiver also provides an opportunity to assess fears or concerns related to the abuse⁴ and to stress the importance of engaging in evidence-based trauma-focused mental health therapy. A recent study found that trauma symptoms in children were highly associated with the degree of self-blame the child felt about the abuse incident(s), an issue which can be addressed during the medical evaluation.⁶ This can also be an opportunity to assess whether the caregiver is supportive and protective of the child through the disclosure process. At the conclusion of the examination the medical provider should explain to the caregivers the significance of physical findings, if any, and that a normal examination does not exclude abuse.

Examination

All children who are suspected victims of child sexual abuse should be offered an examination performed by a medical provider with specialized training in sexual abuse evaluation (Table 1). The urgency of the medical evaluation can be prioritized as emergency, urgent, or non-urgent (Table 2). An emergency evaluation should be done without delay, urgent and non-urgent evaluations should be done within 1 to 7 days. Some children will benefit from follow-up examinations with a specialized provider to re-assess findings and conduct further testing⁷, particularly if acute injury or sexually transmitted infection (STI) is suspected (Table 2).

Previous versions of the guidelines suggested changing the “72-hour rule” for evidence collection in prepubertal children to the “24-hour rule”.⁸ Subsequent studies have confirmed that DNA is predominantly recovered when examinations of prepubertal children are conducted less than 24 hours from the time of the assault.^{9, 10} Research on the use of DNA amplification in

sexual assault is limited in young children, but Y-chromosome specific DNA has been recovered in young female victims presenting 24 hours after assault.^{11, 12} Importantly, the presence of significant physical findings does not predict recovery of foreign DNA and should not be the basis for collecting forensic evidence.¹⁰ Additionally, DNA can still be recovered following genital wiping after the event.¹²

At this time, forensic evidence collection is recommended for sexual contact that may have resulted in the exchange of biologic material within 24 hours in prepubertal children and within 72 hours in adolescents.¹³ Some young children will still benefit from evidence collection beyond 24 hours,¹³ especially in areas where DNA amplification is performed as part of crime lab analysis. Some jurisdictions have expanded the evidence collection window on adolescent and adult sexual assault to 5-7 days since sperm may be recovered from the cervix more than 72 hours after an assault.¹⁴ Collection of clothing, bedding, or other household items which may harbor potential trace evidence can occur at a later time and is not the role of the medical provider. Clinicians should become familiar with regional resources and recommendations regarding collection of evidence.

Documentation

The medical record should include history, physical examination, and laboratory findings.¹⁵ The results and interpretation of the medical evaluation should be summarized carefully with unambiguous language that can be understood by non-medical professionals.¹⁶ Photodocumentation is recommended as a standard of care¹⁵ especially for examinations with positive findings since abnormal examination findings are rare. Diagnostic quality still images or videos allow for expert review for quality assurance, teaching, and legal proceedings¹⁷, however photographs never substitute for detailed written descriptions of the examination findings.

Testing for Sexually Transmitted Infections

Culture of potentially infected sites has traditionally been the diagnostic gold standard for cases of possible sexual abuse/assault.^{18, 19} Culture is costly and limited by low sensitivity, especially in the identification of *Chlamydia* infection (as low as 20 % sensitive in prepubertal girls).²⁰ Nucleic acid amplification testing (NAAT) has been in use for years in the sexually active adolescent and adult populations due to its higher sensitivity (100% by transcription mediated amplification),²⁰ ability to collect a sample non-invasively, ability to test for both *Neisseria gonorrhoea* and *Chlamydia trachomatis* with one sample, and its lower cost compared to culture. The Food and Drug Administration has not approved the commercially available NAATs for use in prepubertal children, as the low prevalence of sexually transmitted infections in this population (< 5 %)²⁰ compared to adolescents and adults makes it difficult to perform large randomized controlled trials for validation. However, their use has been studied in this population²⁰ and the Centers for Disease Control (CDC) discusses their usage in the 2010 Sexually Transmitted Diseases Treatment Guideline: “NAATs can be used as an alternative to culture with vaginal specimens or urine from girls whereas culture remains the preferred method for urethral specimens or urine from boys and for extra-genital specimens for all children”¹

Black, et al. performed a multi-site study comparing genital culture to NAAT in pre and post pubertal children being evaluated for sexual abuse which serves as the foundation for the CDC’s recommendations on this topic.²⁰ Even though there were boys included in the study population (51/536), none of the boys tested positive for a sexually transmitted infection and extra-genital site comparison testing was not included. Therefore, the CDC recommendations for NAA testing for sexually transmitted infections in young children are limited to recommendations on genital testing in girls.

In 2014 the CDC removed its recommendation for routine additional testing when a NAAT is positive for *C. trachomatis*, however there is still a recommendation to consider re-testing with an alternate target for *N. gonorrhoeae*, and for “consultation with an expert” when using NAATs in cases of child sexual abuse evaluation.²¹ When NAATs are used to diagnose infection in prepubertal children or older children in which the result could have significance in legal proceedings, confirmatory testing should be performed to exclude a possible false positive result.^{20, 22, 23}

Although the CDC still recommends culture for non-genital sites, many practitioners find it difficult to access cultures. NAATs have been evaluated in adult studies for pharyngeal^{24, 25} and ano-rectal^{26, 27} infections. NAATs (especially Strand Displacement Amplification [SDA] and Transcription Mediated Amplification [TMA]) have been found to have superior sensitivity to detecting infection at these sites compared to culture and specificity rates that are well within the range of acceptable for clinical practice. The practitioner must be familiar with the validation and confirmation practices of the laboratory processing specimens from their patients. If NAATs are used for testing in young children, and the results could have forensic significance, the practitioner should develop a strategy for confirmatory testing since the low prevalence of infection in this population lowers the positive predictive value of the result.

Culture by Diamond’s or *InPouch TV*© media remains the most specific method of diagnosis of *Trichomonas vaginalis*.²⁸ When identified by wet mount examination, there is a potential to misidentify non-pathogenic intestinal species of *Trichomonas* (such as *T. hominis*) due to morphologic similarities²³ and the possibility of fecal cross-contamination. Additionally, the wet mount is estimated to be only 50% sensitive in detecting trichomonads. Rapid testing is now available by nucleic acid probe hybridization and TMA, but there have been no published

studies regarding the use of these techniques for detecting *T. vaginalis* in children. While these tests may offer more rapid turnaround and higher sensitivity than culture, confirmatory testing should be considered in cases where the result could have forensic significance and the population has a low prevalence of infection (e.g., young children). At present, NAAT for *T. vaginalis* is limited to TMA. However, several research polymerase chain reaction (PCR) tests are being studied showing greater sensitivity compared to wet mount or culture.²³

Interpretation of Findings

See Table 3. Additions to the guidelines table since the prior version are noted in bold, including a section on conditions that often are erroneously attributed to sexual abuse trauma²⁹. Several deletions also were made. Flattened anal folds were removed from “findings commonly caused by medical conditions other than trauma or sexual contact” because no studies have addressed the association of flattened anal folds with sexual contact. The language “anal dilatation to less than 2 centimeters” was removed since the significance of anal dilation of a certain size is unknown. Anal dilation is a dynamic sign and measuring maximum anal dilation during the examination is difficult. Earlier studies on measurement utilizing photographs^{30, 31} used different techniques, so results cannot be compared. One recent study reports reflex anal dilation in 36% of sexually abused children when examined in the lateral position with buttock separation for 30 seconds.³² In another study, total anal dilation occurred in 12% of the suspected abuse group and was significantly associated with reported anal penetration, after controlling for examination position and presence of anal symptoms.³³ Further research is needed to assess the significance of anal findings with respect to abuse, and the impact of examination positions, techniques, and other factors on the frequency of these findings.

The “Indeterminate” category has been relabeled as “No Consensus” regarding the significance of a particular examination finding for sexual abuse. The term “Indeterminate” was often misinterpreted by clinicians to mean case information is insufficient or inadequate.³⁴ The lack of expert consensus does not mean that there is no scientific evidence regarding the findings in this category. These findings have been associated with sexual abuse in some studies in which study populations were too small, whereas other studies have documented the finding in a non-abused population or have not found an association with sexual abuse.

One examination finding that is listed under the “No Consensus” heading is a notch in the inferior rim of the hymen that may extend nearly to the base of the hymen. This finding has some support as being associated with sexual abuse,^{35,36} but there is currently no consensus among experts as to the level of certainty that the finding is due to trauma. One challenge in interpreting the significance of a deep notch is defining it. Previously, a deep notch was defined as a notch that extended through more than 50% of the width of the hymen.³⁶ However, in clinical practice it is virtually impossible to measure or estimate the percentage of the hymenal width through which a notch extends. This finding must be differentiated from other variations such as a scalloped edge of hymen or a narrow section of the hymen rim adjacent to a mound. Even if a notch in the inferior rim of the hymen clearly extends nearly to the base of the hymen, the expert panel did not reach consensus that it should be considered clear evidence of prior injury.

Providers

The provision of medical care to child sexual abuse victims has become increasingly specialized. In December 2013 there were 324 diplomates of the American Board of Pediatrics with subspecialty certification in Child Abuse Pediatrics (CAP).³⁷ Additionally, the International Association of Forensic Nurses (IAFN) has established guidelines for the specialized training of

pediatric sexual assault nurse examiners (SANE-P) in the care of the child victims of sexual assault,³⁸ which include a competency-based clinical preceptorship with an experienced provider.

Medical evaluations should be performed by a qualified provider with experience in child sexual abuse. These professionals may include child abuse pediatricians, SANE-Ps, or physicians and mid-level practitioners with advanced training in child abuse evaluation. The medical provider, regardless of degree, should have formal education and training in the medical evaluation of child sexual abuse. Medical providers need to be familiar with guidelines and recommendations on the medical evaluation of children available from the American Academy of Pediatrics (AAP)² and on the identification and treatment of STIs¹.

Qualified medical providers need to maintain currency of practice through continuing education and peer review. Photodocumentation is recommended by the AAP², National Children's Alliance (NCA)¹⁵, and IAFN³⁸. Medical peer review involves participation in expert review of photo-documented findings, particularly those thought to be abnormal or indicative of sexual abuse. Medical providers who perform higher numbers of child sexual abuse examinations³⁹, read current medical literature, and regularly review cases with an expert demonstrate greater diagnostic accuracy in child sexual abuse evaluations⁴⁰.

All medical programs evaluating victims of child sexual abuse, including programs that utilize nurse examiners or SANEs, benefit from the supervision and guidance of a qualified medical director who demonstrates competency and currency of practice in the evaluation of child sexual abuse. A medical director is necessary to develop protocols and delegated orders, formulate medical diagnoses, and provide medical treatment plans and prescriptions.

Expert Review of Examination Findings

The purpose of peer review in any medical context is the improvement of quality of care for patients. Standardization of medical processes is designed to reduce variability, improve care, reduce mortality and morbidity, and decrease costs. The cost of misdiagnosis can be both financial, in the case of expensive medical procedures, and societal, if child abuse is inaccurately diagnosed based on an examiner's misinterpretation of physical findings. Imaged-based specialties such as radiology and pathology have studied inter-rater reliability issues and have proposed methodology for improvement.⁴¹⁻⁴³

While the child's history remains the most important piece of evidence in child sexual abuse evaluations, physical findings resulting from sexual abuse, when present, are important in the investigative and legal arena. Examiners must critically evaluate findings in the context of the known medical literature. Many studies suggest that inexperienced examiners are far more influenced by the history than are more experienced examiners in assessing examination findings.⁴⁴ These studies also show that an experienced examiner provides more consistent and objective interpretation of examination findings.^{40, 44, 45} Although it is not clear at what level of experience an examiner becomes an expert, it is certainly through training, clinical experience, knowledge of the current literature, continuing education, and engagement in review or oversight of cases. One study demonstrated that variability in interpretation of such findings appears to be linked to level of training, profession, experience, and knowledge of the literature.⁴⁶

Clinicians without sexual abuse expertise can access expert consultation remotely. One example is myCaseReview, a secure Web-based telehealth product in which medical providers submit images for review by a medical panel of board-certified CAP experts (<http://www.mrcac.org/medical-academy/mycasereview/>). Other telehealth and telemedicine applications are available commercially that can provide secure HIPAA compliant case

review.⁴⁶⁻⁴⁸ The use of such programs satisfies the requirements of the National Children's Alliance (NCA,) but may not go far enough in providing comprehensive assessment of the quality of examinations. Feedback to examiners, followed by documented improvement against shared baselines, is the backbone of an iterative process for continuous quality improvement in the field.

Court Testimony

Providing expert medical testimony requires a thoughtful, thorough approach and knowledge of court proceedings that often is outside the realm of standard medical practice.^{49, 50} The AAP has a policy on Guidelines for Expert Witness Testimony⁵¹ and other medical specialties have published guidelines as well⁵²⁻⁵⁶. The role of the expert medical provider in courtroom proceedings is as an educator to the judge and jury, explaining why and how the evaluation was completed, providing details of the examination, and providing expert opinion on the significance of any examination findings. Since a majority of sexual abuse victims have normal genital examinations,^{36, 57} a common theme in testimony is the explanation of the findings and that a physical examination alone does not prove or disprove that sexual abuse occurred.

Conclusions

The recommendations in these revised guidelines incorporate current research and practice guidelines for clinicians who evaluate children and adolescents for suspected sexual abuse (Table 4). During the revisions of these guidelines, several areas of focus for additional research were identified (Table 5). In addition, several terms are clarified, components of the Interpretation Table have been reorganized, and recommendations for improving overall quality of care have been elaborated. While the Interpretation Table remains an important component of

this evolving treatise, the importance of the child's history in the diagnosis of sexual abuse cannot be overstated. Similarly, the patient's medical and mental health needs must be prioritized during the medical assessment. The provider has a key role in gathering the medical history, evaluating the medical and mental health needs of the child, and educating families, multidisciplinary partners, judges and jurors in the appropriate assessment, interpretation of findings, and management of sexually abused children and adolescents.

Acknowledgements

The authors thank Tim Kutz, MD, Mark Hudson, MD, and Deborah Lowen, MD for their contribution to the consensus document. We also are grateful to Jane Braun, MA, and Kori Stephens, MPH of the Midwest Regional Children's Advocacy Center for their financial and administrative support of this project.

References

1. Workowski KA, Berman S, Centers for Disease C, et al. Sexually transmitted diseases treatment guidelines, 2010. *MMWR Recommendations and reports : Morbidity and mortality weekly report Recommendations and reports / Centers for Disease Control* 2010;59:1-110.
2. Jenny C, Crawford-Jakubiak JE, Committee on Child A, et al. The evaluation of children in the primary care setting when sexual abuse is suspected. *Pediatrics* 2013;132:e558-567.
3. Adams JA, Kaplan RA, Starling SP, et al. Guidelines for medical care of children who may have been sexually abused. *Journal of pediatric and adolescent gynecology* 2007;20:163-172.
4. Finkel MA, Alexander RA. Conducting the medical history. *Journal of child sexual abuse* 2011;20:486-504.
5. Delago C, Deblinger E, Schroeder C, et al. Girls who disclose sexual abuse: urogenital symptoms and signs after genital contact. *Pediatrics* 2008;122:e281-286.
6. Melville JD, Kellogg ND, Perez N, et al. Assessment for self-blame and trauma symptoms during the medical evaluation of suspected sexual abuse. *Child Abuse Negl* 2014;38:851-857.
7. Gavril AR, Kellogg ND, Nair P. Value of follow-up examinations of children and adolescents evaluated for sexual abuse and assault. *Pediatrics* 2012;129:282-289.
8. Adams JA. Guidelines for medical care of children evaluated for suspected sexual abuse: an update for 2008. *Curr Opin Obstet Gynecol* 2008;20:435-441.
9. Thackeray JD, Hornor G, Benzinger EA, et al. Forensic evidence collection and DNA identification in acute child sexual assault. *Pediatrics* 2011;128:227-232.
10. Girardet R, Bolton K, Lahoti S, et al. Collection of forensic evidence from pediatric victims of sexual assault. *Pediatrics* 2011;128:233-238.

11. Sibille I, Duverneuil C, Lorin De La Grandmaison G, et al. Y-STR DNA amplification as biological evidence in sexually assaulted female victims with no cytological detection of spermatozoa. *Forensic Sci Int* 2002;125:212-216.
12. Maiquilla SM, Salvador JM, Calacal GC, et al. Y-STR DNA analysis of 154 female child sexual assault cases in the Philippines. *Int J Legal Med* 2011;125:817-824.
13. Christian CW. Timing of the medical examination. *Journal of child sexual abuse* 2011;20:505-520.
14. U.S. Department of Justice. A National Protocol for Sexual Assault Medical Forensic Examinations Adults/Adolescents. In: Office on Violence Against Women, ed., 2013.
15. National Children's Alliance. Standards for Accredited Members, Revised. Washington D.C., 2011.
16. Finkel MA, Ricci LR. Documentation and Preservation of Visual Evidence in Child Abuse. *Child Maltreat* 1997;2:322-330.
17. Ricci LR. Photodocumentation in child abuse cases. In: Jenny C, ed. *Child Abuse and Neglect: Diagnosis, Treatment and Evidence*. St. Louis, Missouri: Elsevier Saunders, 2011.
18. Esernio-Jenssen D, Barnes M. Nucleic acid amplification testing in suspected child sexual abuse. *Journal of child sexual abuse* 2011;20:612-621.
19. Shapiro RA, Makoroff KL. Sexually transmitted diseases in sexually abused girls and adolescents. *Curr Opin Obstet Gynecol* 2006;18:492-497.
20. Black CM, Driebe EM, Howard LA, et al. Multicenter study of nucleic acid amplification tests for detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in children being evaluated for sexual abuse. *Pediatr Infect Dis J* 2009;28:608-613.
21. Centers for Disease C, Prevention. Recommendations for the laboratory-based detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae*--2014. *MMWR Recommendations and*

- reports : Morbidity and mortality weekly report Recommendations and reports / Centers for Disease Control 2014;63:1-19.
22. Hammerschlag MR, Guillen CD. Medical and legal implications of testing for sexually transmitted infections in children. *Clinical microbiology reviews* 2010;23:493-506.
 23. Hammerschlag MR, Gaydos CA. Guidelines for the use of molecular biological methods to detect sexually transmitted pathogens in cases of suspected sexual abuse in children. *Methods in molecular biology* 2012;903:307-317.
 24. Giannini CM, Kim HK, Mortensen J, et al. Culture of non-genital sites increases the detection of gonorrhoea in women. *Journal of pediatric and adolescent gynecology* 2010;23:246-252.
 25. Bachmann LH, Johnson RE, Cheng H, et al. Nucleic acid amplification tests for diagnosis of *Neisseria gonorrhoeae* oropharyngeal infections. *J Clin Microbiol* 2009;47:902-907.
 26. Bachmann LH, Johnson RE, Cheng H, et al. Nucleic acid amplification tests for diagnosis of *Neisseria gonorrhoeae* and *Chlamydia trachomatis* rectal infections. *J Clin Microbiol* 2010;48:1827-1832.
 27. Cosentino LA, Campbell T, Jett A, et al. Use of nucleic acid amplification testing for diagnosis of anorectal sexually transmitted infections. *J Clin Microbiol* 2012;50:2005-2008.
 28. Gallion HR, Dupree LJ, Scott TA, et al. Diagnosis of *Trichomonas vaginalis* in female children and adolescents evaluated for possible sexual abuse: a comparison of the InPouch TV culture method and wet mount microscopy. *Journal of pediatric and adolescent gynecology* 2009;22:300-305.
 29. Ambrosetti F, Palazzo E, Gibelli D, et al. The risk of misinterpreting genital signs of sexual abuse in cadavers: a case report. *Int J Legal Med* 2013;127:907-910.
 30. Mccann J, Voris J, Simon M, et al. Perianal findings in prepubertal children selected for nonabuse: a descriptive study. *Child Abuse Negl* 1989;13:179-193.

31. Myhre AK, Bemtzen K, Bratlid D. Perianal anatomy in non-abused preschool children. *Acta Paediatr* 2001;90:1321-1328.
32. Hobbs CJ, Wright CM. Anal signs of child sexual abuse: a case-control study. *BMC Pediatr* 2014;14:128.
33. Myhre AK, Adams JA, Kaufhold M, et al. Anal findings in children with and without probable anal penetration: a retrospective study of 1115 children referred for suspected sexual abuse. *Child Abuse Negl* 2013;37:465-474.
34. Starling SP, Frasier LD, Jarvis K, et al. Inter-rater reliability in child sexual abuse diagnosis among expert reviewers. *Child Abuse Negl* 2013;37:456-464.
35. Berkoff MC, Zolotor AJ, Makoroff KL, et al. Has this prepubertal girl been sexually abused? *JAMA* 2008;300:2779-2792.
36. Berenson AB, Chacko MR, Wiemann CM, et al. A case-control study of anatomic changes resulting from sexual abuse. *Am J Obstet Gynecol* 2000;182:820-831; discussion 831-824.
37. The American Board of Pediatrics. *Workforce Data 2013-2014*. Chapel Hill, NC, 2014.
38. International Association of Forensic Nurses. *Sexual Assault Nurse Examiner (SANE) Education Guidelines*. Elkridge, MD, 2013.
39. Campbell R, Patterson D, Dworkin E, et al. Anogenital injuries in childhood sexual abuse victims treated in a pediatric Forensic Nurse Examiner (FNE) program. *Journal of forensic nursing* 2010;6:188-195.
40. Adams JA, Starling SP, Frasier LD, et al. Diagnostic accuracy in child sexual abuse medical evaluation: role of experience, training, and expert case review. *Child Abuse Negl* 2012;36:383-392.
41. Bender LC, Linnau KF, Meier EN, et al. Interrater agreement in the evaluation of discrepant imaging findings with the Radpeer system. *AJR Am J Roentgenol* 2012;199:1320-1327.

42. Ng WK, Chiu CS, Cheng Y, et al. Toward implementation of a regional quality assurance program in cytopathology: the Hong Kong experience. *Acta cytologica* 2006;50:164-177.
43. Nisbet D, McLennan A, Robertson A, et al. Reducing inter-rater variability in the assessment of nuchal translucency image quality. *Fetal Diagn Ther* 2011;30:128-134.
44. Sinal SH, Lawless MR, Rainey DY, et al. Clinician agreement on physical findings in child sexual abuse cases. *Arch Pediatr Adolesc Med* 1997;151:497-501.
45. Adams JA. Medical evaluation of suspected child sexual abuse: it's time for standardized training, referral centers, and routine peer review. *Arch Pediatr Adolesc Med* 1999;153:1121-1122.
46. Frasier LD, Thraen I, Kaplan R, et al. Development of standardized clinical training cases for diagnosis of sexual abuse using a secure telehealth application. *Child Abuse Negl* 2012;36:149-155.
47. Kellogg ND, Lamb JL, Lukefahr JL. The use of telemedicine in child sexual abuse evaluations. *Child Abuse Negl* 2000;24:1601-1612.
48. Thraen IM, Frasier L, Cochella C, et al. The use of TeleCAM as a remote Web-based application for child maltreatment assessment, peer review, and case documentation. *Child Maltreat* 2008;13:368-376.
49. Johnson SL. Paediatric expert witness. *J Paediatr Child Health* 2013;49:611-613.
50. Frasier LD, Makoroff KL. Medical Evidence and Expert Testimony in Child Sexual Abuse. *Juvenile and Family Court Journal* 2006;57:41-50.
51. American Academy of Pediatrics Committee of Medical Liability: Guidelines for expert witness testimony. *Pediatrics* 1989;83:312-313.
52. Kesselheim AS, Studdert DM. Role of professional organizations in regulating physician expert witness testimony. *JAMA* 2007;298:2907-2909.

53. Committee on Ethics ACOO, Gynecologists. ACOG Committee Opinion No. 374: Expert testimony. *Obstet Gynecol* 2007;110:445-446.
54. American Medical Association. Opinion 9.07 - Medical Testimony, 2004.
55. Phillips E, Stark SW. Stepping up to be an expert witness. *Nurse Pract* 2013;38:8-11.
56. Williams MA, Mackin GA, Beresford HR, et al. American Academy of Neurology qualifications and guidelines for the physician expert witness. *Neurology* 2006;66:13-14.
57. Adams JA, Harper K, Knudson S, et al. Examination findings in legally confirmed child sexual abuse: it's normal to be normal. *Pediatrics* 1994;94:310-317.
58. Starling SP, Jenny C. Forensic examination of adolescent female genitalia: the Foley catheter technique. *Arch Pediatr Adolesc Med* 1997;151:102-103.
59. Floyed RL, Hirsh DA, Greenbaum VJ, et al. Development of a screening tool for pediatric sexual assault may reduce emergency-department visits. *Pediatrics* 2011;128:221-226.

Table 1. Examination Techniques

Genital Exam Prepubertal Child		Anal Exam Prepubertal Child	
Exam positions	Supine frog-leg or lithotomy Prone knee-chest (PKC)	Exam positions (in order of preference)	Supine knee-chest Prone knee-chest Lateral decubitus
Exam technique	Labial separation and traction Prone knee-chest with gluteal lift Speculum exams not indicated unless child sedated	Exam technique	Buttock separation Prone knee-chest with gluteal lift
Confirmatory technique	Floating hymen with water or saline Prone knee-chest with gluteal lift	Confirmatory technique	Reassess after bowel movement, ambulating, or alternate position
Genital Exam Pubertal Child		Anal Exam Pubertal Child	
Exam positions	Supine lithotomy Prone knee-chest with gluteal lift	Exam positions	Supine knee-chest Prone knee-chest Lateral decubitus
Exam technique	Labial separation and traction Speculum exam can be done if \geq Tanner 3	Exam technique	Lateral buttock separation Gluteal lift in PKC
Confirmatory technique	Trace hymenal rim with cotton tip swab Foley catheter ⁵⁸ Prone knee-chest with gluteal lift	Confirmatory technique	Reassess after bowel movement, ambulating, or alternate position

Table 2. Timing of Medical Examinations

<p>Indications for <u>emergency</u> evaluation^{13,59}</p> <ul style="list-style-type: none"> • Medical, psychological or safety concerns such as acute pain or bleeding, suicidal ideation, or suspected human trafficking • Alleged assault that may have occurred within the previous 72 hours (or other state-mandated time interval) necessitating collection of trace evidence for later forensic analysis • Need for emergency contraception • Need for post-exposure prophylaxis (PEP) for STIs including Human Immunodeficiency Virus (HIV)
<p>Indications for <u>urgent</u> evaluation</p> <ul style="list-style-type: none"> • Suspected or reported sexual contact occurring within the previous 2 weeks, without emergency medical, psychological or safety needs identified
<p>Indications for <u>non-urgent</u> evaluation</p> <ul style="list-style-type: none"> • Disclosure of abuse by child, sexualized behaviors, sexual abuse suspected by MDT, or family concern for sexual abuse, but contact occurred more than 2 weeks prior without emergency medical, psychological or safety needs identified
<p>Indications for <u>follow-up</u> evaluation</p> <ul style="list-style-type: none"> • Findings on the initial examination are unclear or questionable necessitating reevaluation • Further testing for STIs not identified or treated during the initial examination • Documentation of healing/resolution of acute findings • Confirmation of initial examination findings, when initial examination was performed by an examiner who had conducted fewer than 100 such evaluations

Table 3. 2015 Approach to Interpretation of Medical Findings in Suspected Child Sexual Abuse

*This table lists medical and laboratory findings; however, most children who are evaluated for suspected sexual abuse will not have physical signs of injury or infection. The child's description of what happened and report of specific symptoms in relationship to the events described are both essential parts of a full medical evaluation. **Items in bold type have been added or revised in this updated version of the table.***

Findings Documented in Newborns or Commonly Seen In Non-abused Children*

Normal variants

1. Normal variations in appearance of the hymen
 - a. Annular: hymenal tissue present all around the vaginal opening including at the 12 o'clock location
 - b. Crescentic hymen: hymenal tissue is absent at some point above the 3 to 9 o'clock locations
 - c. Imperforate hymen: hymen with no opening
 - d. Micro-perforate hymen: hymen with one or more small openings
 - e. Septate hymen: hymen with one or more septae across the opening
 - f. Redundant hymen: hymen with multiple flaps, folding over each other
 - g. Hymen with tag of tissue on the rim
 - h. Hymen with mounds or bumps on the rim at any location
 - i. **Any notch or cleft of the hymen (regardless of depth) above the 3 and 9 o'clock location**
 - j. **Superficial notches of the hymen at or below the 3 and 9 o'clock location.**
 - k. Smooth posterior rim of hymen that appears to be relatively narrow along the entire rim
2. Periurethral or vestibular band(s)
3. Intravaginal ridge(s) or column(s)
4. External ridge on the hymen
5. Linea vestibularis (midline avascular area)
6. Diastasis ani (smooth area)
7. Perianal skin tag(s)
8. Hyperpigmentation of the skin of labia minora or perianal tissues in children of color
9. Dilation of the urethral opening

Findings commonly caused by medical conditions other than trauma or sexual contact[#]

10. Erythema of the genital tissues
11. Increased vascularity of vestibule and hymen
12. Labial adhesion
13. Friability of the posterior fourchette
14. Vaginal discharge
15. **Molluscum contagiosum**
16. Anal fissure(s)
17. Venous congestion or venous pooling in the perianal area
18. Anal dilatation in children with pre-disposing conditions, such as current symptoms or history of constipation and/or encopresis, or children who are sedated, under anesthesia or with impaired neuromuscular tone for other reasons, such as post-mortem.

Conditions Mistaken for Abuse

19. Urethral prolapse
20. Lichen sclerosus et atrophicus
21. Vulvar ulcer(s)
22. Erythema, inflammation, and fissuring of the perianal or vulvar tissues due to infection with bacteria, fungus, viruses, parasites, or other infections that are not sexually transmitted
23. Failure of midline fusion, also called perineal groove
24. Rectal prolapse
25. **Visualization of the pectinate/dentate line at the juncture of the anoderm and rectal mucosa**
26. **Partial dilatation of the external anal sphincter, with the internal sphincter closed, causing the appearance of deep creases in the peri-anal skin**
27. **Red/purple discoloration of the genital structures (including the hymen) from lividity post-mortem, confirmed by histological analysis.**

Findings With No Expert Consensus on Interpretation with Respect to Sexual Contact or Trauma^{}**

28. Complete anal dilatation with relaxation of both the internal and external anal sphincters, in the absence of other predisposing factors such as constipation, encopresis, sedation, anesthesia, and neuromuscular conditions
29. **Notch or cleft in the hymen rim, at or below the 3 or 9 o'clock location, which is deeper than a superficial notch and may extend nearly to the base of the hymen, but is not a complete**

transection.

30. Genital or anal condyloma acuminatum in the absence of other indicators of abuse; **lesions appearing for the first time in a child older than 5 years may be more likely to be the result of sexual transmission**²²
31. Herpes Type 1 or 2, confirmed by culture or PCR testing, in the genital or anal area of a child with no other indicators of sexual abuse²²

Findings Caused by Trauma and/or Sexual Contact##

Acute trauma to external genital/anal tissues, which could be accidental or inflicted

32. Acute laceration(s) or bruising of labia, penis, scrotum, perianal tissues, or perineum
33. Acute laceration of the posterior fourchette or vestibule, not involving the hymen

Residual (healing) injuries to external genital/anal tissues (These rare findings are difficult to diagnose unless an acute injury was previously documented at the same location.)

34. Perianal scar
35. Scar of posterior fourchette or fossa

Injuries indicative of acute or healed trauma to the genital/anal tissues

36. Bruising, **petechiae, or abrasions** on the hymen
37. Acute laceration of the hymen, of any depth; partial or complete
38. **Vaginal laceration**
39. **Perianal laceration with exposure of tissues below the dermis**
40. **Healed hymenal transection/complete hymen cleft- a defect in the hymen between 4 o'clock and 8 o'clock that extends to the base of the hymen, with no hymenal tissue discernible at that location.**
41. A defect in the posterior (inferior) half of the hymen wider than a transection with an absence of hymenal tissue extending to the base of the hymen.

Infections transmitted by sexual contact, unless there is evidence of perinatal transmission or clearly, reasonably and independently documented but rare non-sexual transmission

42. Genital, rectal or pharyngeal Neisseria gonorrhoea infection
43. Syphilis
44. Genital or rectal Chlamydia trachomatis infection
45. Trichomonas vaginalis infection

46. HIV, if transmission by blood transfusion has been ruled out

Diagnostic of sexual contact

46. Pregnancy

47. Semen identified in forensic specimens taken directly from a child's body

Footnote

* These findings are normal and are unrelated to a child's disclosure of sexual abuse.

These findings require that a differential diagnosis be considered, as each may have several different causes.

** These physical and laboratory findings may support a child's disclosure of sexual abuse, if one is given, but should be interpreted with caution if the child gives no disclosure. Physical findings (number 28 and 29) should be confirmed using additional examination positions and/or techniques. Additional information, such as mother's gynecologic history or child's history of oral lesions may clarify likelihood of sexual transmission for children with condyloma or Herpes. After complete assessment, a report to Child Protective Services may be indicated in some cases. Photographs or video recordings of these findings should be evaluated and confirmed by an expert in sexual abuse evaluation to ensure accurate diagnosis.

These findings support a disclosure of sexual abuse and are highly suggestive of abuse even in the absence of a disclosure, unless a timely and plausible description of accidental injury is provided by the child and/or caretaker. Physical findings (items 32 through 41) should be confirmed using additional examination positions and/or techniques. Diagnoses of the sexually transmitted infections must be confirmed by additional testing to avoid assigning significance to possible false positive screening test results. Photographs or video recordings of these findings should be evaluated and confirmed by an expert in sexual abuse evaluation to ensure accurate diagnosis.

Table 4. Recommendations for Providers

- Obtain a medical history from the child / adolescent patient for the purpose of diagnosis and treatment
- Develop skills in the use of examination positions and techniques for the best assessment of anogenital findings
- Know the differential diagnosis of entities confused with sexual abuse, to avoid an incorrect diagnosis
- Remain current in the state of the art and science of child sexual abuse medical evaluation and treatment
- Obtain high quality, interpretable photodocumentation of examination findings
- Develop a peer review system to have all abnormal cases reviewed by an expert provider
- Teach MDTs that all children benefit from a medical evaluation by a qualified provider
- Provide court testimony that is objective, fact-based, educational, and clear for medical and non-medical audiences

Table 5. Suggested Research Questions

- What is the role of the medical history in the forensic investigation of child sexual abuse?
- With new forensic evidence analyses available, should the timing of forensic collection change for children or adolescents?
- Can NAATs be used for extragenital site testing for gonorrhea and chlamydia in children and/or adolescents?
- Can NAATs be used to detect Trichomonas or Herpes in children and adolescents?
- Should NAATs be used for routine screening in prepubertal boys?
- What is the significance of findings listed in the “No Expert Consensus” category with regards to likelihood of sexual contact/abuse?
- How do examination position and techniques and/or anal symptoms affect anal findings?
- Can deep notches be readily differentiated from complete transections in photographs and/or videos?