

Medical Evaluation of Suspected Child Sexual Abuse: 2009 Update

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Introduction

In the field of medical evaluation of suspected child sexual abuse, research studies and expert opinion have provided the basis for several revisions of an approach to interpreting medical and laboratory findings in children who may have been sexually abused. A description of a current revision was published in the Summer 2005 issue of the *APSAC Advisor* (Vol. 17, No. 3). The most recent version of this approach was published in 2007 after a process of consensus development (Adams et al., 2007). This article describes new studies published since the 2007 paper was submitted, describes recently completed systematic reviews of older studies, and makes suggestions for updating the Approach to Interpretation table.

Healing of Acute Trauma in Prepubertal Girls

McCann, Miyamoto, Boyle, and Rogers (2007a) reported on a review of 113 cases of prepubertal girls who had photo-documentation of acute trauma to the genital tissues and who had at least one follow-up examination to determine healing. The cases were gathered from multiple sites in a retrospective manner, preventing any standardization of examination method, photo-documentation methods, or the number and timing of follow-up examinations.

In the review of photographs, the authors identified and classified 40 lacerations of the hymen among the prepubertal girls, and 35 (88%) were in the posterior/inferior location below the 3 o'clock–9 o'clock line. At the time of the follow-up examination, it was found that 75% of the acute, partial tears through more than 50% of the width of the hymen had healed to be notches extending through 50% or more of the width of the hymen.

When the hymen tear was classified as being a tear all the way through the hymen and into the fossa (transection with extension), 74% of these tears at the follow-up examinations were complete clefts/transections after healing. Of note, none of the hymen injuries resulted in scars at the follow-up examinations.

In another paper, McCann and colleagues (2007b) reported that deep lacerations of the posterior fourchette or perineum in

prepubertal girls took 2–3 weeks to heal, but the majority of abrasions, contusions, and submucosal hemorrhages of the genital tissues healed within days.

An important finding, reported in both of the previously referenced papers, is that many injuries to the hymen and to other genital tissues had healed completely at the time of follow-up examination, leaving no sign of the previous injury. In a few cases, even significant hymen lacerations healed to leave no clear sign of injury. Therefore, in cases where an examination is conducted several days, weeks, or months after the suspected episode of sexual abuse and no clear sign of injury to the genital tissues is evident, the possibility of previous injury cannot be ruled out. Therefore, if a child describes an incident of abuse that caused pain or bleeding, or both, an examination done weeks later could very well be normal. However, the fact that injuries can heal completely, or heal as superficial or deep notches in the hymen, does not allow one to conclude that all notches in the hymen were caused by penetration.

Importance of Child's History

Although the Approach to Interpretation table focuses on medical examination findings and laboratory test results, it is widely accepted that in most cases of suspected sexual abuse, there will not be signs of significant injury, healed trauma, or sexually transmitted infections. The child's medical history is key in helping to determine if a child had specific symptoms around the time of the episode of alleged abuse that could help validate the child's description of the abuse experience.

DeLago, Deblinger, Shroeder, and Finkel (2008) reviewed the medical records of 161 girls ages 3–18 years who were evaluated for suspected abuse and who had disclosed specific types of genital contact. All patients were asked open-ended, non-leading questions about body sensations during the history obtained by the medical provider. If a child disclosed genital contact, she was asked: "How did that feel?" If necessary, the doctor would ask follow-up questions, such as: "Did it bother your body, your feelings, or both?"

Genital symptoms were reported by 60% of the girls, and the symptoms of dysuria and genital pain were significantly more

common in girls reporting genital-genital contact compared with other types of genital contact, when controlling for age. This study highlights the importance of a complete medical history and review of symptoms when children are evaluated for suspected sexual abuse. Even if someone else takes the detailed history of the episode of possible abuse, the medical provider needs to ask the child directly about how his or her body felt during and after the abusive episode. Although there may not be any signs of injury on examination, the medical provider can correlate the child's description of symptoms to the description of the acts the child experienced and can testify to that in court.

Evaluating the Data From Research Studies

A systematic review by Berkoff and colleagues (2008) of more than 1,500 published articles and book chapters identified ten research studies of prepubertal children selected for non-abuse, and one case control study of girls ages 3–8 years with and without a history of vaginal penetration. The review was conducted as an attempt to determine the utility of the genital examination in prepubertal girls in identifying non-acute sexual abuse. The criteria for inclusion in the systematic review were that studies had to contain data on pubertal status or age or both, have sufficient data for statistical analysis, use a well-described or reproducible examination technique, and include a reference standard to determine whether the child had or had not been sexually abused.

The findings of a deep notch in the inferior hymen, transection of the hymen, and perforation of the hymen were not found in the studies of non-abused children and were specific for a history of sexual abuse in the case-control study. None of these findings had high sensitivity to detect abuse, however, because they were rare in children who gave a history of penetration. The authors concluded that these three findings "suggest genital trauma from sexual abuse" (p. 2790).

Comparable systematic reviews are needed of published research studies reporting medical examination findings in other types of patients. What is the positive predictive value of the finding of a deep hymen notch in an adolescent, or the finding of anal dilation in a child examined acutely or non-acutely following alleged anal penetration? Additional research is needed to answer both of these questions, but a careful review of published papers could help provide a more evidence-based approach to interpreting medical examination findings. The results of such a systematic review might indicate that the approach to interpreting some of the findings cited in the table should be reassessed.

Conditions Mistaken for Abuse

Many conditions such as labial adhesions, vaginal discharge, genital bumps and ulcers; skin conditions such as lichen sclerosus; unusual conditions such as urethral prolapse, perineal

groove/failure of midline fusion, and others can be mistaken for signs of trauma or infection. In a study of pattern recognition (Muram & Simmons, 2008) among residents and faculty in pediatrics, family medicine, emergency medicine, and gynecology at a major teaching hospital, color photographs of common pediatric gynecologic conditions were shown to residents and faculty physicians. The mean correct response rate was 42% for residents and 58% for faculty. Photographs of urethral prolapse, labial adhesion, and uncomplicated vulvovaginitis were often incorrectly identified as being signs of suspected abuse.

It is clear that physicians who are asked to examine a child's genitalia for routine care or to evaluate complaints or symptoms must have basic knowledge of normal anatomy and common and uncommon conditions that may affect the appearance of the genital or anal tissues. A specific category of conditions commonly mistaken for signs of abuse has been added to the Approach to Interpretation table to increase awareness in health care professionals who examine children for possible abuse.

Herpes Simplex Virus Type 1 and 2 (HSV-1, HSV-2) In an article published in 2008, I reviewed studies related to herpes simplex infections in children and the seroprevalence of HSV-1 and HSV-2 in children of different ages. There are no case control studies of genital herpes or positive antibodies for HSV-2 in children with and without concerns for sexual abuse. In the reviewed studies, investigators typically reported histories of sexual abuse most commonly in children who were 5 years of age or older, who had HSV-2 cultured from genital lesions, and who did not have oral lesions (Adams, 2008). The suggestions for interpreting genital herpes infections have been changed slightly in Table 1.

Genital Warts Genital warts in children represent infections that could have been transmitted by sexual contact. Multiple studies of newborn infants, mothers and fathers, and children without a concern of abuse have shown evidence of human papilloma virus (HPV) DNA on the skin, mucous membranes, or both (Shapiro & Makoroff, 2006). It is likely that the virus itself can be spread by caretaking activities and perinatal exposure, and this could result in the development of warts in the genital or anal area in infants and young children. Children with anogenital warts who are outside the age range where someone is assisting them with toileting hygiene and who do not have warts on other parts of their bodies deserve a very careful evaluation for suspected sexual abuse. While each case should be evaluated on its own merits, it is reasonable to recommend reporting to child protective services if lesions of HPV are found in an older child, even if the child denies a history of sexual abuse.

The Importance of Accurate Interpretation of Medical Findings Most examinations for signs of sexual abuse are done

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Table 1. Approach to Interpretation of Medical Findings in Suspected Child Sexual Abuse: 2009

This table lists medical and laboratory findings; however, most children who are evaluated for suspected sexual abuse will not have signs of injury or infection. The child's description of what happened to him or her and the child's report of specific symptoms in relationship to the events described is an essential part of the full medical evaluation.

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

The presence of these findings generally neither confirms nor discounts a child's clear disclosure of sexual abuse.

Normal variants

1. Periurethral or vestibular bands
2. Intravaginal ridges or columns
3. Hymenal bumps or mounds
4. Hymenal tags or septal remnants
5. Linea vestibularis (midline avascular area)
6. Hymenal notch/cleft in the anterior (superior) half of the hymenal rim (prepubertal girls), on or above the 3 o'clock–9 o'clock line with patient supine
7. Shallow/superficial notch or cleft in inferior rim of hymen below 3 o'clock–9 o'clock line
8. External hymenal ridge
9. Congenital variants in appearance of hymen, including crescentic, annular, redundant, septate cribiform, microperforate, and imperforate
10. Diastasis ani (smooth area)
11. Peri-anal skin tag
12. Hyperpigmentation of the skin of labia minora or peri-anal tissues in children of color, such as Mexican-American and African-American children
13. Dilatation of the urethral opening with application of labial traction
14. "Thickened hymen" (May be due to estrogen effect, folded edge of hymen, swelling from infection, or swelling from trauma. The latter is difficult to assess unless follow-up examination is done.)

Findings commonly caused by other medical conditions

15. Erythema (redness) of the genital tissues (May be due to irritants, infection, or dermatitis.)

16. Increased vascularity ("dilatation of existing blood vessels") of vestibule and hymen. (May be due to local irritants or normal pattern in the non-estrogenized state.)
17. Labial adhesion (May be due to irritation or rubbing.)
18. Vaginal discharge (There are many infectious and non-infectious causes. Cultures must be taken to confirm if caused by sexually transmitted organisms or other infections.)
19. Friability of the posterior fourchette or commissure (May be due to irritation, infection, or an examiner's traction on the labia majora.)
20. Anal fissures (Usually due to constipation, peri-anal irritation.)
21. Venous congestion or venous pooling in the peri-anal area (Usually due to positioning of child; also seen with constipation.)

Conditions Mistaken for Abuse*

22. *Urethral prolapse**
23. *Lichen sclerosus et atrophicus**
24. *Vulvar ulcers (May be caused by many types of viral infections, including Epstein-Barr virus (EBV) and influenza, or by conditions such as Behcet's disease or Crohn's disease.)**
25. *Failure of midline fusion, also called perineal groove**
26. *Rectal prolapse (often caused by infection, such as Shigella sp.)**
27. *Complete dilation of the internal and external anal sphincters, less than 2 centimeters in AP diameter, revealing the pectinate line**
28. *Partial dilation of the external anal sphincter, with the internal sphincter closed, causing the appearance of deep folds in the peri-anal skin that can be mistaken for signs of injury**
29. *Marked erythema, inflammation, and fissuring of the peri-anal or vulvar tissues due to infection with Group A beta hemolytic streptococci**

*Changes from the version published in 2007 are in *bold italics*. Adapted from: Adams et al. (2007, 163–172).

Indeterminate Findings: Insufficient or Conflicting Data From Research Studies, or No Expert Consensus

These physical and laboratory findings may support a child's clear disclosure of sexual abuse, if one is given, but should be interpreted with caution if the child gives no disclosure. Report to Child Protective Services may be indicated in some cases.

30. Deep notches or clefts in the posterior/inferior rim of hymen that extend through more than 50% of the width of the hymen
31. Deep notches or complete clefts in the hymen at the 3 o'clock or 9 o'clock location in adolescent girls
32. Marked, immediate anal dilation to an AP diameter of 2 cm or more, in the absence of other predisposing factors such as chronic constipation, sedation, anesthesia, and neuromuscular conditions
33. Genital or anal condyloma acuminata in child, in the absence of other indicators of abuse. ***Lesions appearing for the first time in a child older than 5–8 years may be more suspicious for sexual transmission.****
34. Herpes Type 1 or 2 in the genital or anal area in a child with no other indicators of sexual abuse. ***Isolated genital lesions caused by HSV-2 in a child older than 4–5 years may be more suspicious for sexual transmission.****

Findings Diagnostic of Trauma and/or Sexual Contact

*The following findings support a disclosure of sexual abuse, if one is given, and are highly suggestive of abuse even in the absence of a disclosure, unless a clear, timely, plausible description of accidental injury is provided by the child and/or caretaker. **Photographs or video recordings of these findings should be reviewed by an expert in sexual abuse evaluation for a second opinion to assure accurate diagnosis.****

Acute trauma to external genital/anal tissues

35. Acute lacerations or extensive bruising of labia, penis, scrotum, peri-anal tissues, or perineum (May be from unwitnessed accidental trauma or from physical or sexual abuse.)
36. Fresh laceration of the posterior fourchette, not involving the hymen (Must be differentiated from dehisced labial adhesion or failure of midline fusion (see #25). Posterior fourchette lacerations may also be caused by accidental injury or by consensual sexual intercourse in adolescents.)

Residual (healing) injuries

These rare findings are difficult to assess unless an acute injury was previously documented at the same location.

37. Peri-anal scar (May be due to other medical conditions such as Crohn's disease, accidental injuries, or previous medical procedures.)
38. Scar of posterior fourchette or fossa (Pale areas in the midline may also be due to linea vestibularis or labial adhesions.)

Injuries indicative of blunt force penetrating trauma (or from abdominal/pelvic compression injury if such history is given)

39. Extensive bruising on the hymen
40. Laceration (tear, partial or complete) of the hymen (acute)
41. Peri-anal lacerations extending deep to the external anal sphincter (not to be confused with partial failure of midline fusion)
42. Hymenal transection (healed). An area between 4 o'clock and 8 o'clock on the rim of the hymen, where it appears to have been torn through, to or nearly to the base, so there appears to be virtually no hymenal tissue remaining at that location. This finding has also been referred to as a "complete cleft" in sexually active adolescents and young adult women.
43. Missing segment of hymenal tissue. Area 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, which is confirmed using additional positions or methods.

Presence of infection confirms mucosal contact with infected and infective bodily secretions; contact most likely to have been sexual in nature

44. Positive confirmed culture for gonorrhea, from genital area, anus, or throat, in a child outside the neonatal period
45. Confirmed diagnosis of syphilis, if perinatal transmission is ruled out
46. Trichomonas vaginalis infection in a child older than 1 year of age, with organisms identified by culture or, in vaginal secretions, by wet mount examination
47. Positive culture from genital or anal tissues for Chlamydia, if child is older than 3 years at time of diagnosis and if specimen was tested using cell culture or comparable method approved by the Centers for Disease Control
48. Positive serology for HIV if perinatal transmission, transmission from blood products, and needle contamination have been ruled out

Diagnostic of sexual contact

49. Pregnancy
50. Sperm identified in specimens taken directly from a child's body

* Changes from the version published in 2007 are in ***bold italics***. Adapted from: Adams et al. (2007, 163–172).

Table 2. Results of an Online Survey of 100 Members of the Ray E. Helfer Society, Spring 2009

Experience level:		Agree with "Indeterminate" for deep notch in posterior hymen, adolescent girl?	
a) Conduct more than 20 evaluations per month:.....	32	a) Yes	66
b) Conduct 10–20 evaluations per month:	35	b) No.....	26
c) Conduct fewer than 10 evaluations per month	25	c) Unsure.....	8
d) Not currently clinically active.....	8		
Supervise or review others cases?		If you don't agree, how should it be interpreted?	
a) No	13	a) I do agree.....	65
b) Fewer than 10 cases per month.....	38	b) Should be considered more normal	8
c) Review 10–20 cases per month	35	c) Should be considered suspicious for trauma.....	14
d) Review more than 20 cases per month.....	14	d) Should be considered suggestive of trauma	8
		e) Other.....	5
Familiar with the Approach to Interpretation table published in 2007?		How should condyloma accuminata in a child be interpreted?	
a) Yes	96	a) Indeterminate for sexual transmission, regardless of age of the child	20
b) No or unsure.....	4	b) Indeterminate, less worrisome if <2 yrs old.....	33
		c) Indeterminate, more concerning if child older than 5–8 years	49
		d) Other	6
Should the table be updated based on research findings?		How should genital herpes simplex infection in a child be interpreted?	
a) Yes	16	a) Indeterminate for both HSV-1 and HSV-2.....	41
b) No.....	23	b) Genital HSV-2 more suspicious for sexual transmission.....	18
c) Possibly.....	36	c) Both HSV-1 and HSV-2 more suspicious if child is outside age range where caretaker is performing genital hygiene on child	40
d) Unsure	25	d) Other	7
Agree with "Indeterminate" for deep notch in posterior hymen, prepubertal girl?			
a) Yes	53		
b) No.....	40		
c) Unsure.....	7		
If you don't agree, how should it be interpreted?			
a) I do agree.....	50		
b) Should be considered more normal	3		
c) Should be considered suspicious for trauma	32		
d) Should be considered suggestive of trauma	11		
e) Other.....	4		

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some time after the last incident of abuse, and this is one of the main reasons why abnormal genital findings are rare. Because most examinations are normal or show signs that could have explanations other than abuse, many physicians and nurses who provide sexual abuse medical evaluations may have limited experience with cases of acute trauma. The National Children's Alliance (NCA) has published revised medical standards for members who work in accredited facilities, which recommend photo-documentation as the standard of care. Peer review of medical findings is strongly encouraged. Medical providers at

these accredited facilities and in other settings now have the opportunity to obtain timely, anonymous expert review of sexual abuse medical findings via the TeleHealth Institute for Child Maltreatment's (THICM) new Web-based system.

Digital images of examination findings in either photographs or video clips can be uploaded to the Web site, along with the medical history and the examiner's interpretation of the findings. When a case is posted, a physician from a panel of national experts will be notified to review the case anonymously and will

send a response within 48 hours. The expert will provide an opinion as to whether or not he or she agrees with the examiner's interpretation of the medical findings, or may recommend that additional photo-documentation is necessary in order to provide a review. There is a minimal \$25 per case charge to the examiners who want to take advantage of this resource as part of quality improvement activities for child sexual abuse medical evaluations.

The purpose of THICM is to make child sexual abuse expert review available to all Child Advocacy Center medical providers and to other providers who perform child sexual abuse medical evaluations throughout the United States regardless of location. However, it must be cautioned that the service is designed solely to provide reviews by an expert for educational and quality improvement purposes. It is not intended for initial diagnostic or treatment purposes or to serve as a second opinion for a specific case. This service is not a replacement for a consultation or meant to address issues related to a specific patient. More information is available at the Web site: <http://www.thicm.org>.

How Well Do Experts Agree?

As a follow-up to an online survey assessing agreement on medical findings, conducted in 2007, I recently did a short survey of physician experts in child sexual abuse medical evaluation. One hundred members of the Ray E. Helfer Society responded to all items on a 12-question survey conducted via the Helfer Society listserv. The results are shown in Table 2. Because the listing of findings in Table 1 includes those findings for which there is no consensus among experts as to their interpretation with respect to trauma or abuse, it appears that all findings listed there currently should still be considered indeterminate.

Conclusion

Efforts are currently underway to perform a systematic review of published research and expert opinion to help determine the diagnostic significance of specific acute genital and anal injuries, non-acute findings in adolescents, anal findings in both children and adolescents, and specific sexually transmitted infections. These reviews may provide evidence suggesting that some of the findings listed in Table 1 should be interpreted differently.

Medical providers and other members of multidisciplinary teams working with children who may have been sexually abused are advised to remember that medical findings are rarely the most important part of an evaluation for suspected sexual abuse. The absence of signs of injury in a child who gives a clear disclosure of sexual abuse, even if the contact involved vaginal or anal penetration and resulted in symptoms of pain or bleeding or both, does not mean that the child was not abused in the manner he or she described. Studies have documented rapid and complete healing of both major and minor genital and anal injuries following sexual assault (McCann et al., 2007a; McCann et al.,

2007b). If medical findings are identified that are felt to be signs of trauma or sexually transmitted infections, it is advisable for providers either to seek a second opinion from an expert consultant or to utilize the anonymous expert review services through www.thicam.org, as a quality assurance method.

There have been a few minor changes to the 2007 table presented here, and more changes may be necessary as researchers conduct new studies and publish systematic reviews of previously published literature. Medical providers are invited to contact Dr. Adams with comments and suggestions at jadams@ucsd.edu.

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