

## **Approach to the Interpretation of Medical and Laboratory Findings in Suspected Child Sexual Abuse: A 2005 Revision**

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When child sexual abuse is suspected, a medical examination is often one part of the overall evaluation. A suspicion of sexual abuse may result when a child has disclosed such abuse, has developed behaviors suggestive of sexual abuse, is diagnosed with a sexually transmissible infection, when there are suggestive medical or laboratory findings, or because the abuse has been witnessed by others or documented by photographs or videotapes. Health care providers responsible for performing medical examinations in these situations are often asked by parents, care givers, social service workers, or law enforcement officers whether or not any "evidence" of sexual abuse was found.

During the past 15 years, many changes have occurred in the way medical professionals perform evaluations of children suspected of having been sexually abused, and in how physical and laboratory findings are interpreted (Heger, Ticson, Velasquez, & Bernier, 2002). During the early 1990s, research studies documented genital and anal findings in children who were not suspected of having been sexually abused, which provided medical practitioners with a better understanding of the range of normal variations in the appearance of these tissues (McCann, Voris, Simon, & Wells, 1989; McCann, Wells, Simon, & Voris, 1990; Berenson, Heger, & Andrews, 1991; Berenson, Heger, Hayes, Bailey, & Emans, 1992).

A comprehensive listing of findings in nonabused children and medical and laboratory findings associated with suspected child sexual abuse was first published as a table in an article by Adams, Harper, and Knudson (1992). This classification system, sometimes referred to as the Adams Classification System, had been developed using published data on both abused and nonabused children. It was intended to assist team members to arrive at sound conclusions from medical evaluations of children suspected of having been sexually abused, and to help achieve some consistency among these providers in interpreting their medical findings.

The table, listing physical and laboratory findings, has been modified multiple times since 1992 in response to newly published research findings in order to refine the characterization of listed medical findings not supported by research data. The most recent set of revisions was begun in January, 2003, when groups of interested physicians were convened at the San Diego Child Maltreatment Conference and at annual meetings of the Ray Helfer Society. Participating physicians were asked to review the most recently published version of the document, to reassess the listings of medical and laboratory findings, and to attempt to reach consensus on how to define and interpret those medical findings. In January, 2004, under the sponsorship of the American Professional Society on the Abuse of Children, a group of 18 physicians met to further discuss proposed changes. These physicians achieved consensus on most of the criteria to be included in the document, including those criteria

that should be listed for newborns and nonabused children as well as criteria thought to be diagnostic of trauma or sexual contact. The document was then circulated via e-mail to 46 physicians in the United States and Canada who had expressed interest in being involved in the revision process.

The document produced as a result of these reviews is included in Table 1. It has received support from the majority of physicians who participated in the review process. This version does not differ significantly from the 2004 version of the proposed classification system, which was published in the *Journal of Pediatric and Adolescent Gynecology* (Adams, 2004), but it has been renamed to remove the word *classification* from the title. The research studies that support inclusion of specific findings under each heading are referenced in the body of the instrument for each listed finding. Many of these studies are cross-sectional and retrospective in nature; only a few are

prospective, longitudinal, or case control studies. The recommendations for interpreting the significance of sexually transmissible infections or lesions differ slightly from the guidelines published by the American Academy of Pediatrics (AAP) Committee on Child Abuse and Neglect (2005), and those differences are noted in the table.

The tables in the article published by the author in 2001 continued to incorporate a section, titled "Overall Assessment of the Likelihood of Sexual Abuse." The rating categories in the Overall Assessment table were "no evidence of abuse," "possible abuse," "probable abuse," and "definitive evidence of penetrating injury

or sexual contact." To rate the first three categories required heavy reliance on historical information from the child and other professionals, behavior changes observed in the child, and direct observations from witnesses, in addition to medical and laboratory findings. It had become clear that the Overall Assessment section was being inappropriately used by some programs as a checklist approach to the diagnosis of child sexual abuse, a use for which it was never intended. It was also believed that inexperienced medical providers were using the tables as a substitute for a more thorough clinical assessment and determination of the likelihood of sexual abuse.

In response, the author solicited input from medical colleagues to refine and clarify the instrument's purpose and content and to redesign it accordingly. All participants agreed that the revised document should be used solely as a tool to assist medical providers in making clinical determinations of the possible significance of medical findings in children they evaluated for suspected sexual abuse. The tool was also intended to provide guidelines for teaching physicians and nurses to demonstrate what is known, and what is not known, about physical findings in abused and nonabused children. Subsequent to these decisions, the Overall Assessment table, which was present in previous versions, was removed.

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There is not complete agreement regarding this listing of findings and its guidelines for interpretation among physicians with expertise in the medical evaluation of suspected child sexual abuse. Several contributors still believe strongly that findings such as deep notches in the hymen and a marked narrowing of the rim of the hymen should be listed as more significant than "indeterminate." The majority of participants, however, do agree that these findings should not be considered diagnostic of trauma, because at present, data from published research are insufficient to justify that conclusion. Pragmatically, it is also problematic to rely on measurements as small as one millimeter, or to determine whether a notch is through 50% or more than 50% of the width of the hymen. Medical or laboratory findings of indeterminate significance could raise the suspicion of sexual abuse, even in the absence of a history from the child. In those cases, a report to child protective services, for further investigation, is appropriate.

Other participants are skeptical of an approach that does not emphasize the importance of the child's statement in the overall medical evaluation, which of necessity must include more than just a physical examination. It is clear that the history from the child is the most important part of any evaluation for suspected child sexual abuse. Further, unless the physical examination is performed within a very short time after an assault that causes injury, the physical exam will likely show no signs of either acute or healed trauma. We also know that injuries to the genital and anal tissues heal rapidly and often completely, and that many types of sexual contact do not cause apparent physical injury. As reported in studies since 2000, the percentage of children giving a history of abuse who have abnormal physical examination findings is about 4% to 5% (Heger et al., 2002; Berenson, Chacko, Wiemann, Mishaw, Friedrich, & Grady, 2000) in most clinical settings.

Certainly, children suspected of having been sexually abused deserve to be heard and believed in addition to receiving careful medical evaluations. Further, children deserve to have as much attention directed to what they disclose about their abuse experiences as to the microscopic appearance of their genital or anal tissues. However, sexually abused children are often too young to provide a coherent history, and some may deny having experienced any acts that may have caused injury. In these circumstances, physical examination findings may take on greater importance in the overall evaluation. Medical professionals must take great care to interpret physical findings using research-derived knowledge concerning the variations of normal and the particular conditions that may be mistaken as abuse. That said, the history provided by the child, the child's medical history, the history as reported by parents or other care givers regarding behavioral or emotional changes in a child, and the results of a careful physical examination must all be integrated into a comprehensive assessment by those individuals with responsibility to perform these evaluations.

Accurate documentation, using diagnostic-quality photographs or videotapes of the examination, is essential for health care providers conducting medical evaluations of children and youth who may

have been sexually abused. It is also helpful for physicians, nurse practitioners, physician assistants, and nurses to have access to experts who can review records, photographs, and/or videotapes of examination findings in difficult cases, especially when a child is too young to provide a history, or the history is insufficient to explain the injuries. High-quality still photographs or videotapes that provide sufficient magnification to clearly show all the genital and anal tissues are necessary for meaningful peer review and to obtain second opinions.

For newly trained providers, or for those practicing in relative isolation, consultation can be obtained from experts in children's hospitals, medical schools, or regional referral centers located throughout the United States and Canada. Medical providers who perform these evaluations should establish formal networks for ongoing peer review of cases and continuing medical education. The Ray E. Helfer Society is an honorary association of physicians who are recognized as leaders in the field of child abuse evaluation, treatment, or prevention. A listing of current members and their academic affiliations is available at [www.helfersociety.org](http://www.helfersociety.org). However, not all members are active in the medical evaluation of suspected sexual abuse.

In this rapidly evolving field, health care providers with responsibility to examine children for suspected child sexual abuse also need opportunities to participate in comprehensive and ongoing educational programs and peer review. They should have access to expert consultation as needed. Continual review of the literature is also essential for health care providers to attain and maintain competence in a field as dynamic and critically important as this.

The document presented in Table 1, Approach to Interpreting Physical and Laboratory Findings in Children With Suspected Sexual Abuse: 2005 Revision, reflects the latest thinking on how findings should be considered and interpreted when evaluating children who may have been sexually abused. This document replaces all prior tables in publications referred to as the Adams Classification or Research-Based Classification.

The individuals who actively participated in the revision process, either in person or via e-mail, are listed in Table 2. The listing of individual names here does not necessarily imply complete agreement with every detail of the document, but rather is an acknowledgment of one's participation in the process over the last several years and general acceptance of the final product.

Finally, participants in the review process have acknowledged that these guidelines may continue to undergo revisions as additional research studies are completed that clarify the significance and appropriate interpretation of clinical findings.

Medical professionals must take great care to interpret physical findings using research-derived knowledge concerning the variations of normal and the particular conditions that may be mistaken as abuse.

**TABLE 1. APPROACH TO INTERPRETING PHYSICAL AND LABORATORY FINDINGS IN SUSPECTED CHILD SEXUAL ABUSE: 2005 REVISION**

This product is the result of an ongoing collaborative process by child maltreatment physician specialists, under the leadership of Joyce A. Adams, MD.

This document was developed to provide a useful tool to assist health care providers in interpreting physical examination findings and laboratory results, based on information currently available in the medical literature.<sup>1-34</sup> It may also be useful in training health care providers who are learning how to conduct examinations of children. Because updated research studies continue to appear in the medical literature, this document will likely undergo further revisions.

A medical evaluation of suspected child sexual abuse involves much more than a physical examination. Any medical professional who provides these examinations should be able to obtain a medical history from the parent/caretaker and also from the child, if developmentally appropriate. Details of the alleged events leading to the request for an examination should be obtained by the individual(s) designated by local protocols. The health care professional who examines the child needs to understand and utilize the process of differential diagnosis, since many physical signs and symptoms may be caused by conditions other than abuse.

**IMPORTANT NOTE:** Recent studies have shown that 85% to 95% of children who have given clear histories of being sexually abused will have no findings of acute or healed trauma on examination, either because the injuries they sustained have healed completely by the time they are examined, or because the acts of abuse did not cause any physical injury to the child.<sup>8, 21, 22</sup> Many children do not have a clear concept of what “penetration” means, and they may be describing rubbing or pushing against their external genitalia or between the buttocks or, for prepubertal girls, penetration beyond the labia majora but not the hymen. Even penile penetration of the anus or the hymen may not cause any injury, because of partial penetration or because of the ability of the tissues to stretch<sup>25</sup> or it may cause minor injuries that heal completely.<sup>22</sup>

The numbering of the findings below is for ease of reference only and does not imply increasing significance.

### Findings Documented in Newborns, or Commonly Seen in Nonabused 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<sup>9, 17, 30, 10, 8, 6</sup>
2. Intravaginal ridges or columns<sup>9, 30, 10, 8, 6, 32</sup>
3. Hymenal bumps or mounds<sup>9, 17, 30, 10, 8, 6, 32</sup>
4. Hymenal tags or septal remnants<sup>9, 17, 30, 10, 8, 6</sup>
5. Linea vestibularis (midline avascular area)<sup>17, 30, 6, 26, 32</sup>
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, patient supine<sup>9, 10, 8, 6</sup>
7. Shallow/superficial notch or cleft in inferior rim of hymen (below 3 o’clock–9 o’clock line)<sup>9, 17, 10, 8, 6, 20, 4, 28, 22, 19</sup>
8. External hymenal ridge<sup>9, 10, 8, 6, 32</sup>
9. Congenital variants in appearance of hymen, including crescentic, annular, redundant, septate,<sup>30, 10</sup> cribriform, microperforate, imperforate<sup>19, 32</sup>
10. Diastasis ani (smooth area)<sup>29, 11, 31</sup>
11. Perianal skin tag<sup>29, 11, 31</sup>
12. Hyperpigmentation of the skin of labia minora or perianal tissues in children of color, such as Mexican-American and African-American children<sup>29, 11</sup>
13. Dilatation of the urethral opening with application of labial traction<sup>17, 30</sup>
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)<sup>17, 30, 4, 28</sup>

#### Findings Commonly Caused by Other Medical Conditions

15. Erythema (redness) of the vestibule, penis, scrotum or perianal tissues (may be due to irritants, infection, or trauma\*)<sup>17, 30, 10, 6, 20, 4, 28, 27, 31, 32</sup>
16. Increased vascularity (“dilatation of existing blood vessels”) of vestibule and hymen (may be due to local irritants, or normal pattern in the nonestrogenized state)<sup>17, 30, 10, 6, 20, 4</sup>
17. Labial adhesion (may be due to irritation or rubbing)<sup>17, 30, 10, 6, 20, 4, 32</sup>
18. Vaginal discharge (many infectious and noninfectious causes; cultures must be taken to confirm if it is caused by sexually transmitted organisms or other infections)<sup>17, 6, 4</sup>

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19. Friability of the posterior fourchette or commissure (may be due to irritation, infection, or may be caused by examiner's traction on the labia majora)<sup>17, 6, 28, 32</sup>
20. Excoriations/bleeding/vascular lesions. These findings can be due to conditions such as lichen sclerosus, eczema or seborrhea, vaginal/perianal Group A streptococcus, urethral prolapse, hemangiomas)<sup>22, 34, 19, 14, 16, 12, 23, 13,</sup>
21. Perineal groove (failure of midline fusion)<sup>19</sup>
22. Anal fissures (usually due to constipation, perianal irritation)<sup>19, 16, 31</sup>
23. Venous congestion, or venous pooling in the perianal area (usually due to positioning of child; also seen with constipation)<sup>29, 11, 31, 4, 27</sup>
24. Flattened anal folds (may be due to relaxation of the external sphincter or to swelling of the perianal tissues due to infection or trauma\*)<sup>29, 4, 27, 31</sup>
25. Partial or complete anal dilatation to less than 2 cm, with or without stool visible (may be a normal reflex, or may have other causes, such as severe constipation or encopresis, sedation, anesthesia, neuromuscular conditions)<sup>29, 4, 27, 31</sup>

\* Follow-up examination is necessary before attributing these findings to trauma

## **INDETERMINATE Findings: Insufficient or Conflicting Data From Research Studies**

(may require additional studies/evaluation to determine significance; these physical/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)

### **Physical Examination Findings**

26. Deep notches or clefts in the posterior/inferior rim of hymen, in contrast to transections (see 41). One case-control study<sup>6</sup> found notches through more than 50% of the width of the posterior hymen only in girls who described digital or penile-vaginal penetration; however, this was seen in only 2/192 girls between the ages of 3 and 8 years alleging penetration. In a study of the appearance of the hymen in adolescent girls admitting consensual intercourse compared with girls who denied such contact, there was not a statistically significant difference in the frequency of deep notches in the posterior rim of hymen, but more girls describing intercourse had deep notches at 3 or 9 o'clock.<sup>2</sup> Distinguishing between superficial notches (through 50% or less of the width of the hymen) and deep notches (through more than 50% of the width of the hymen) can be extremely difficult
27. Deep notches or complete clefts in the hymen at 3 or 9 o'clock in adolescent girls. In the adolescent study referenced above, the finding of deep notches or complete clefts in the hymen at 3 and 9 o'clock was significantly higher in girls admitting vaginal intercourse than in girls who denied intercourse (26% v. 5%, p<.01), but each type of finding was seen in 5 of 58 subjects denying intercourse<sup>2</sup>
28. Smooth, noninterrupted rim of hymen between 4 and 8 o'clock, which appears to be less than 1 millimeter wide, when examined in the prone knee-chest position, or using water to "float" the edge of the hymen when the child is in the supine position. This finding was not seen in girls selected for nonabuse in four separate studies,<sup>30, 10, 6, 32</sup> However, a rim estimated to be less than 1 to 2 millimeters was found in 22% of girls selected for nonabuse in another study.<sup>20</sup> In addition, most experts acknowledge that it is very difficult to accurately measure the posterior rim of hymen in many cases
29. Wart-like lesions in the genital or anal area (may be skin tags or warts not of the genital type; may be condyloma accuminata that was acquired from perinatal transmission or other nonsexual transmission)<sup>34, 18, 5, 19</sup> (biopsy and viral typing may be indicated in some cases)
30. Vesicular lesions or ulcers in the genital or anal area (infectious and noninfectious causes, including herpes, syphilis, varicella or other viruses, Behcet's disease, Crohn's disease, idiopathic causes)<sup>34, 18, 5, 19</sup> (need to obtain viral cultures or PCR<sup>33</sup> to diagnose herpes or serology to diagnose syphilis)
31. Marked, immediate anal dilation to a diameter of 2 cm or more, in the absence of other predisposing factors such as chronic constipation, sedation, anesthesia, neuromuscular conditions (a rare finding in both abused<sup>4</sup> and nonabused<sup>29, 31</sup> children; no consensus exists currently among experts as to how this finding should be interpreted)

### **Lesions With Etiology Confirmed: Indeterminate Specificity for Sexual Transmission**

32\*. Genital or anal condyloma accuminata in child, in the absence of other indicators of abuse<sup>18, 5</sup>

33\*. Herpes Type 1 or 2 in the genital or anal area in a child with no other indicators of sexual abuse<sup>18, 5</sup>

\* Report to child protective services is recommended by AAP Guidelines<sup>5</sup>

## 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.

It is recommended that diagnostic quality photodocumentation of the examination findings be obtained and reviewed by an experienced medical provider before concluding that they represent acute or healed trauma. Follow-up examinations are also recommended.

### Acute Trauma to External Genital/Anal Tissues

34. Acute lacerations or extensive bruising of labia, penis, scrotum, perianal tissues, or perineum (may be from unwitnessed accidental trauma or from physical or sexual abuse)<sup>28, 22, 14, 23</sup>
35. Fresh laceration of the posterior fourchette, not involving the hymen (must be differentiated from dehiscence of labial adhesion or failure of midline fusion; may also be caused by accidental injury<sup>28, 22, 19, 14, 16, 12, 23, 13</sup> or consensual sexual intercourse in adolescents<sup>24</sup>)

### Residual (Healing) Injuries

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

36. Perianal scar (rare; may be due to other medical conditions, such as Crohn's disease, accidental injuries, or previous medical procedures)<sup>27, 22, 19, 14, 13</sup>
37. Scar of posterior fourchette or fossa (pale areas in the midline may also be due to linea vestibularis or labial adhesions)<sup>28, 22</sup>

### Injuries Indicative of Blunt Force Penetrating Trauma, or From Abdominal/Pelvic Compression Injury, If Such History Is Given

38. Laceration (tear, partial or complete) of the hymen, acute<sup>28, 22, 19, 14, 16, 12, 13</sup>
39. Ecchymosis (bruising) on the hymen (in the absence of a known infectious process or coagulopathy)<sup>28, 22, 19, 14, 16, 12, 13</sup>
40. Perianal lacerations extending deep to the external anal sphincter (not to be confused with partial failure of midline fusion)<sup>27, 22, 19, 16, 13</sup>
41. Hymenal transection (healed). An area between 3 and 9 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 must be confirmed using additional examination techniques, such as a swab, prone knee-chest position, Foley catheter balloon (adolescents only), or water to float the edge of the hymen. This finding has also been referred to as a "complete cleft" in sexually active adolescents and young adult women<sup>4, 27, 22, 19, 14, 16, 12, 13, 15, 2</sup>
42. 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/methods<sup>4, 19, 14</sup>

### Presence of Infection Confirms Mucosal Contact With Infected and Infective Bodily Secretions, Contact Most Likely to Have Been Sexual in Nature

- 43\*. Positive confirmed culture for gonorrhea (from genital area, anus, throat) in a child outside the neonatal period<sup>18</sup>
- 44\*. Confirmed diagnosis of syphilis, if perinatal transmission is ruled out<sup>18</sup>
45. 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<sup>18, 5</sup> (by an experienced technician or clinician)
- 46\*. Positive culture from genital or anal tissues for chlamydia, if child is older than 3 years at time of diagnosis and specimen was tested using cell culture or comparable method approved by the Centers for Disease Control<sup>18</sup>
- 47\*. Positive serology for HIV, if perinatal transmission, transmission from blood products and needle contamination have been ruled out<sup>18</sup>

\* Considered diagnostic of sexual transmission by AAP Committee guidelines<sup>5</sup>

### Diagnostic of Sexual Contact

48. Pregnancy<sup>5</sup>
49. Sperm identified in specimens taken directly from a child's body<sup>5</sup>

Table 1 continued on page 12

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## About the Author

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