Genital examination findings – “It’s normal to be normal”

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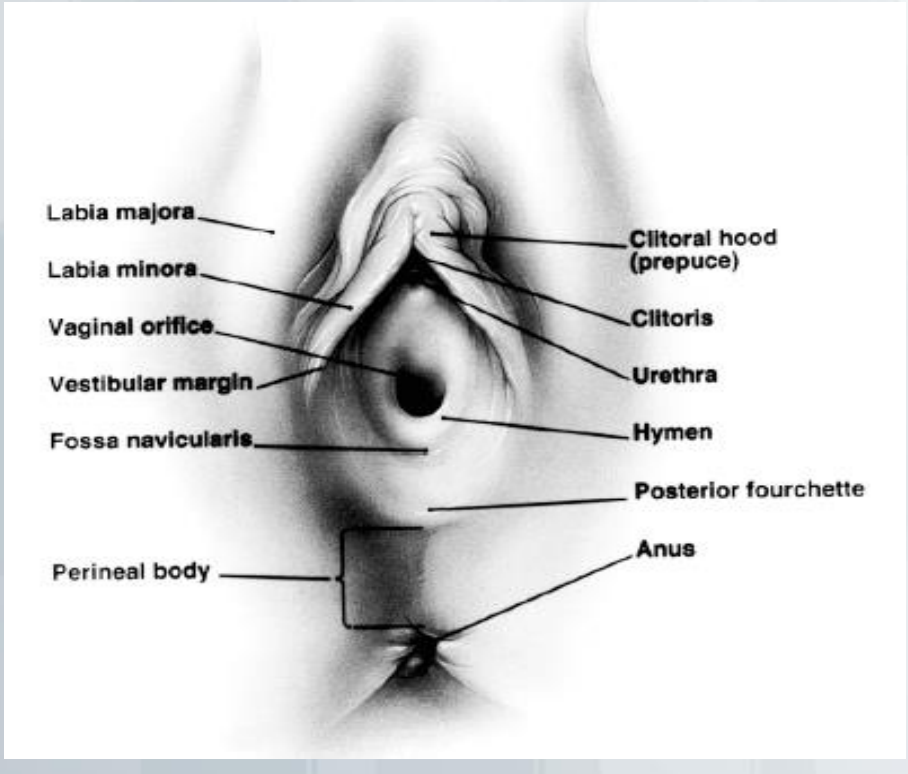
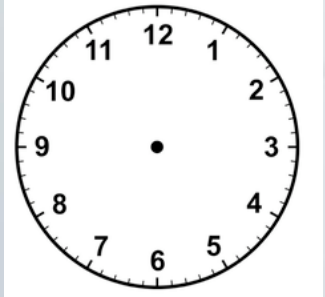
2015 VFPMS Annual Seminar

What is normal?





Studies defining what is normal

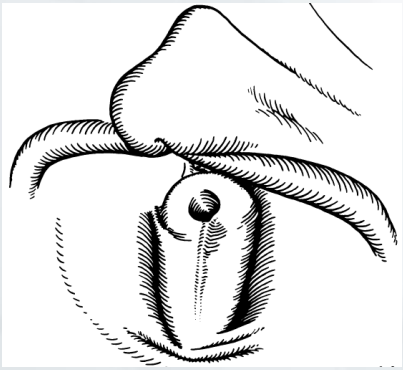
Appearance of the Hymen in Prepubertal Girls

Berenson A, *Pediatrics* 1992: 89; 387-394

211 girls, 1m - 7y, mean 21m
Labial adhesions: extensive 5%, partial 17%, most < 12m
Hymens: fimbriated (redundant) 46% </= 12m, crescentic 51% > 24m
also annular, sleeve-like, septated hymen
Hymens: lacy vascular pattern 98%, rim > 1mm 96% (1/5 with transection)
Hymenal notches: none 4 – 8 o'clock
Hymenal bumps 7%, +/- associated with ridges
Hymenal tags 3%, most inferior or superior
Vestibular bands 98%
Longitudinal intravaginal ridges 25%, 2 (– 5) ridges
External longitudinal ridges 15% (most < 48m)

Also studies on newborn hymens, hymenal morphology 0 – 9y

Normal genitals



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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

Updated Guidelines for the Medical Assessment and Care of Children Who May Have Been Sexually Abused
Joyce A. Adams, MD, Nancy D. Kellogg, MD,
To appear in: *Journal of Pediatric and Adolescent Gynecology*

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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.

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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.**

Case 1 - Anna

5 year old girl alleged,
“Uncle Joe put his finger in my minnie”

Examined 6 days after alleged abuse

What might you find on genital examination?

Possibilities

1. Normal
2. Non-specific
3. Suspicious
4. Abnormal, consistent with trauma

Factors affecting likelihood and extent of genital injuries

Child:

- Anatomy – size and position
- Degree of relaxation, stretch, friability
- Amount of lubrication (physiological, applied)

Perpetrator:

- Object – size and type
- Amount of force used, angle

Elapsed time between alleged abuse and examination

The Literature

Examination Findings in Legally Confirmed Child Sexual Abuse: It's Normal to be Normal

Adams JA, et al, *Pediatrics*. 1994; 94: 310-317

Review of case files and colposcopic photographs of 236 children with perpetrator conviction for sexual abuse (included many plea bargains)

141 cases – 130 girls,11 boys,

Mean age 9.0y (range 8m – 17y 11m), 2/3 > 8y

63% reported penile-genital contact

Girls: 28% normal, 49% nonspecific, **9% suspicious, 14% abnormal = 23%**

Anal penetration: 1% abnormal

2 factors correlated with abnormal findings:

- **time since the last alleged assault** (8/19, 42% within 72 hours)
- **history of blood** (46% abnormal vs. 8%)
- **exam within 72 hours and history blood** (90%)

Abnormal findings:

penile-vaginal penetration > digital-vaginal penetration

Identified need to educate prosecutors

("suspicious": enlarged hymenal opening, immediate anal dilatation)

However…

Many studies in the 80s/90s found high rates of abnormal findings (up to 84%) because some included findings that have since been shown to be normal findings or non-specific anatomical variants:

- enlarged hymenal opening
- narrow posterior hymenal rim
- hymenal deficiency superiorly in crescentic hymens
- partial clefts of posterior hymenal rim, clefts of anterior & lateral hymen
- hymenal bumps, irregularities, vascular markings, rolled edge
- posterior intra-vaginal ridges
- urethral dilatation
- erythema, oedema, discharge, adhesions, friability
- fossa navicularis linear vestibularis
- perineal groove

Studies since have shown much lower rates of abnormal findings:

Children referred for possible sexual abuse: medical findings in 2384 children.

Heger A, et al, *Child Abuse & Neglect.* 2002; 26: 645-659

2384 children, 82% girls, mean age (girls) 6.9y, age range 3m – 14y, blinded peer review

3.7% abnormal findings

- 4.4% - disclosing group ("penetration" = 5.5% abnormal)
- 2.2% - non-disclosing group
- 0.2% - behaviour changes / possible exposure to abuse
- 8% - evaluation of medical findings / conditions

Significant findings

Acute hymenal trauma – abrasions, bruises, lacerations

Healed hymenal transections extending to base

STIs

Positive forensic tests

Pregnancy

Photographic evidence of actual abuse

Berkoff (2008) conducted a systematic review of the literature and concluded that, **other than a hymenal transections**, *genital examination findings "cannot independently confirm or exclude non-acute sexual abuse as the cause of genital trauma in prepubertal girls".*

Genital Findings in Prepubertal Girls: What Can Be Concluded from an Examination? Mini-Review

Pillai M, *J Pediatr Adolesc Gynecol* 2008;21:177-185

- Selection of "non-abused" girls and "controls" an issue
- Robust studies: *Tiny* data, possibly < 1000 "non-abused" girls
- Infrequent normal variants at risk of being labelled "abnormal"
- Berenson best: superficial notches normal
  complete transection = trauma
  hymenal opening measurements unhelpful
  (varies with hymen type, child position, examination method, relaxation, cooperation, age, weight)
- **Posterior hymenal rim: at least 1mm always present unless trauma**, 22% of non-abused girls have rim 1 - 2mm, posterior rim < 1mm very rare

- Healing: rapid and often complete
- Hymen no scarring, but scarring or vascular changes might occur to surrounding tissues
- Only 2 longitudinal healing studies

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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 abuse[22]

Superficial & deep notch/cleft

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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.

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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 gonorrhea 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

AAP guidelines conclusions

"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" 2005

"Since a majority of sexual abuse victims have normal genital examinations, 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." 2015

While interpreting medical findings is an important component of the assessment, "the importance of the child's history in the diagnosis of sexual abuse cannot be overstated" 2015

Case 2 - Cassie

15 year old girl alleged penile-vaginal penetration

Initial dysuria and some lower abdominal pain

Examined 48 hours after alleged assault

What might you find on genital examination?

Majority of examinations will be normal.

Why?

Raised pubertal oestrogen levels result in hymenal changes:

- thickening
- folding
- scalloped edges
- pale appearance
- increased stretch

More literature…

Genital Anatomy in Pregnant Adolescents; "Normal" Does Not Mean "Nothing Happened"

Kellogg N, et al, *Pediatrics.* 2004; 113: e67-69

36 pregnant adolescent girls, average age 15.1y
56% of pregnancies resulted from sexual assault
1 pregnant with 2nd child, 2 D&C 2w – 2m before

82% normal findings

2/36 complete transections, 4/36 findings suggestive of abuse

Also, Adams (2004) reported 52% normal hymenal findings of 85 adolescent girls, average age 16.5y, with and without a history of consenting sexual intercourse.

So why are there so few abnormal findings?

- Nothing happened
- History not accurate
- Absence of injury (likely)
- Pubertal hymen able to stretch over objects without being injured
- Minor injury missed
- Genital mucosal injuries heal quickly
- Healed injury results in the same findings as the tissue pre-assault (regeneration vs. repair)
- Healed injury looks indistinguishable from average, but may be different compared to the tissue pre-assault

Healing of hymenal injuries

Healing of Hymenal Injuries in Prepubertal and Adolescent Girls: A Descriptive Study

McCann J, et al, *Pediatrics.* 2007; 119: e1094-1106

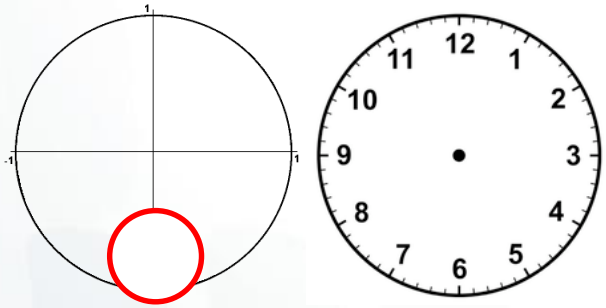
239 girls, range: 4m – 18y, all with hymenal injuries

113 prepubertal girls:
- 21 accidental
- 73 sexual abuse
- 19 "unknown"

126 pubertal adolescents:
- sexual abuse

1st exam: 1h – 3d, 69% < 24h, 87% < 48h,
2nd exam: pre: 24h - 2.5y later, average 9.9m
pub: 1d – 3.7m later, average 61d

Hymenal lacerations - prepubertal



40 lacs in 113 girls

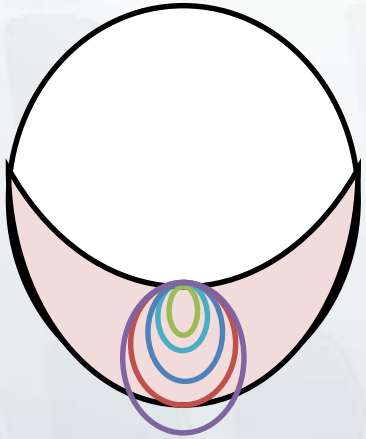
88% in posterior half, of which 75% in or close to midline

Depth: Superficial (<50% width) ⟷ transections + extension

Most became shallower: 68% transections + extension ➡ transections or deep

Some became deeper as swelling settled:

15% deep ➡ transections



Shape:

V-shaped 39% ➡ 18%

Cleft-like 21% ➡ 10%

U-shaped 21% ➡ 46%

Broad U 18% ➡ 23%

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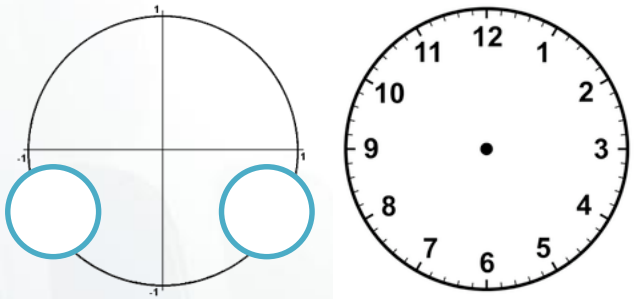
Hymenal lacerations - pubertal

80 lacs in 126 girls
More in posterior half, but only 29%
in or close to midline



Depth:
Superficial (<50% width) ⟷ transections with extension
Most became shallower,
some deeper as swelling settled

Shape: V-shaped 48% ➡ halved ↓
Cleft-like 28% ➡ 22% ↓
U-shaped 24% ➡ 34% ↑
Broad U 1% ➡ 20% ↑

Healing of hymenal injuries

Signs of acute injury settle quickly, within 16 days

Petechiae:	2 days
Abrasions, “mild” submucosal haemorrhages:	3 – 4 days
“Marked” haemorrhages:	11 – 15 days
Blood blisters:	1 month

Healing lacerations alter in shape and depth for up to 3 – 4 weeks
Majority shallowed and smoothed off

No hymenal scarring seen

Hymenal injuries heal rapidly and frequently leave little or no evidence of previous trauma

Healing of non-hymenal genital injuries

Healing of Nonhymenal Genital Injuries in Prepubertal and Adolescent Girls: A Descriptive Study

McCann J, et al, *Pediatrics.* 2007; 120: e1000-1011

Petechiae: 24 hours
Abrasions: 3 days
Blood blisters: 1 month +
Bruises (labia, perineum, post fourchette): 2 – 18 days
Submucosal haemorrhages (vestibule, FN): 2 days – 2 weeks
Haematomas (labia): 2 weeks +
Superficial injuries mostly heal by regeneration, deeper lacerations by repair
Neovasular formation: infrequent, pre only, mucosa of vestibule and FN
Scar tissue formation: infrequent, deep lacerations, pre PF & perineum
Lacerations: healing time depends on depth:
superficial vestibular laceration: 2 days
deep perineal lacerations: 20 days

Summary

History is the most important aspect

Examine ASAP after alleged assault

Examine in different positions – "multi-method":

- Supine / labial separation
- Supine / labial traction
- Prone-knee-chest / gluteal lift

Photodocumentation, peer review

Injuries unlikely – examination findings often ***normal***

Few residual abnormalities after injuries heal – examination findings ***indistinguishable from normal, except***

- Transection of posterior hymen clear indicator of past trauma
- Jury out on deep clefts

"It's normal to be normal"

(2015 AAP Sexual Assault Guidelines)

The Royal Children's Hospital Melbourne

Thanks to:

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The worldwide web

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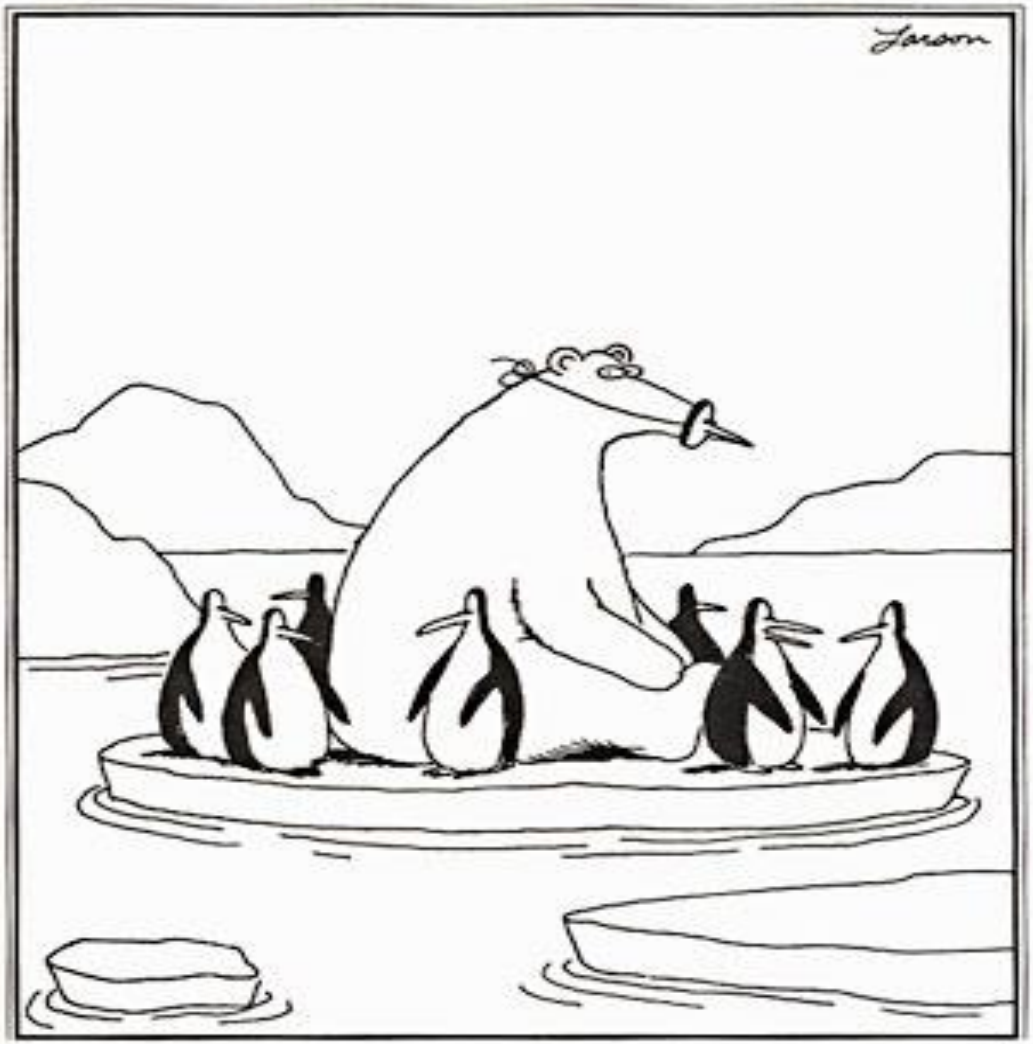

"And now Edgar's gone. ... Something's going on around here."

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