Improving the Performance and Documentation of Infant Genital Examinations in the Newborn Nursery
Rachel Sewell MD; Jennifer Barker MD; Natalie Nokoff MD, MS; Laura Lockwood MD, NEI; Tall Lockspeiser MD, MHPE
University of Colorado Anschutz School of Medicine and Children’s Hospital, Colorado, Aurora CO

Background:
- Screening for differences in sex development (DSD) is highly reliant on the performance of an accurate and complete genital physical examination of infants.
- Providers must have a thorough understanding of variants in infant genital exams.
- Incidence is relatively common: Hypospadias
  - 1 in 200 live births
  - DSD
  - 1 in 1000-4000 live births
- Adult learners in the medical field prefer:
  - Interactive methods
  - Learning by doing
  - Emphasis on practical content

Key Learning Principles Applied:
- Education is contextual
  - Integrate classroom instruction with experiential hands-on learning in newborn nursery
- Enhance the quality of learning through goal-directed practice coupled with targeted feedback
  - Learners receive individual, formative, and focused feedback

Project Objective:
- Improve learner confidence and skill in performing and describing infant genital examinations.

Intervention Design:
- Interactive classroom lecture (30 minutes)
- Newborn Nursery Integration (25 minutes)
- Education Session Survey (5 minutes)

Infant Genital Exam Education Session Content:
- Objectives
  - Identify and describe typical infant genital structures
  - Apply systematic approach to infant genital examination
  - Define ambiguous genitalia
  - Choose next steps including communicating with families
- Infant genital image description practice
  - 1 typical male, 1 typical female, 2 with ambiguous genitalia
- Systematic approach to infant genital exam

Survey Design:
- Retrospective pre and post education session subjective evaluation
  - Confidence in performing infant genital exam and describing findings
  - Likert questions: “Not at all”, “A little”, “Somewhat”, “Mostly”, “Completely”
  - Deemed confident if responded “Mostly” or “Completely”
- Had they received previous infant genital exam training and if so what was the format
- Open ended questions
  - “What was the most valuable aspect of this education session?”
  - “How will you apply what you learned going forward?”
- Demographics
  - Program and Year in Training
  - Assigned sex at birth (ASAB)
  - Gender identity
- Hands-on Practice

Validation Process:
- Recorded Cognitive Interviews
  - 1 Outpatient General Pediatric Attending
  - 1 Pediatric Endocrinology DSD Specialist
  - 1 Newborn Nursery Attending
  - 1 Director of Research

Results:
- Participants:
  - Overall response rate 100% (n=39)
  - Gender Identity: 100% Cisgender
  - ASAB: 87% Female, 13% Male
  - Previously received training: 3% (n=1)
  - Lecture: Child Abuse and Protection Rotation

Table 1: Learner Demographics
<table>
<thead>
<tr>
<th></th>
<th>Number Participated</th>
<th>Female ASAB (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric Residents</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Family Medicine Residents</td>
<td>9</td>
<td>67</td>
</tr>
<tr>
<td>Physician Assistant Students</td>
<td>11</td>
<td>100</td>
</tr>
<tr>
<td>Medical School Students</td>
<td>4</td>
<td>50</td>
</tr>
</tbody>
</table>

Thematic Analysis of Open-Ended Questions:
Most Valuable Aspect:
1. Hands-on experience
   - “Great, low stress session. Complementary method by observed and hands-on experience with immediate feedback”
   - “Appreciated opportunity to consolidate and learn with a hands-on opportunity”
2. Practice describing exam findings
   - “I thought I could [complete and describe] the exam but realized there was a lot I didn’t know.”
   - “Having [us] describe what we were seeing during the lecture and exam was helpful”
3. Urgency of ambiguity on exam
   - “Learning when to consult endo stat”
   - “How to accurately examine [for] ambiguous genitalia and the importance of how quickly it needs to be identified”

Application going forward:
1. Systematic approach
   - “Using the systematic 4 step approach to not miss findings”
   - “I will palpate for gonadal tissue on every exam”
2. Communicating results
   - “Because of [this session], I will always remember a proper exam, documentation, and how to discuss next steps with families”
   - “Thank you for teaching us things to say vs not say to parents of the child”

Discussion:
- Strikingly low percentages of students and residents are confident in performing and describing an infant genital exam, confirming the need for further education.
- The 1-hour education session statistically increased confidence in performing and describing an infant genital exam.
- Education sessions with hands-on practice and formative feedback can keep adult learners engaged and increase confidence in their skills.
- Applying a systematic approach to all infants can increase confidence in accurately performing and describing genital examinations.

Future Directions:
- Evaluate enduring impact of session
  - Newborn nursery and attending survey
  - Witness residents/students implementing systematic approach during rotation
  - Pediatric resident survey
  - >1 month after session, application of systematic approach on other rotations
- Sustainable outputs
  - Pocket size handouts of the systematic approach
  - Video modules demonstrating infant genital exam techniques

Author contact information: rachel.sewell@childrenscolorado.org

Conflicts of interest: Nothing to report.

Works Cited:

Ambiguous Genitalia Example

Figure 2: Confidence in Performing an Infant Genital Exam

Figure 3: Confidence in Describing an Infant Genital Exam