Milestone Attainment of End-of-Year Pediatric Interns: A Multi-institutional Assessment by Objective Structured Clinical Exam

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Background – The Pediatric Milestones

NAS was implemented by ACGME in 2013 to move from process to outcome based program accreditation.

ACGME and ABP developed 51 pediatric competencies and milestones.

ACGME requires semi-annual reporting of each resident's milestones for 21 of the 51 competencies.
### Background – The Pediatric Milestones

**Patient Care 1** Gather essential and accurate information about the patient.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>PC1. GATHER ESSENTIAL AND ACCURATE INFORMATION ABOUT THE PATIENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td>Either gathers too little information or exhaustively gathers information following a template regardless of the patient’s chief complaint, with each piece of information gathered seeming to be as important as the next. Recalls clinical information in the order elicited, with the ability to gather, filter, prioritize, and connect pieces of information being limited by and dependent upon analytic reasoning through basic pathophysiology alone.</td>
</tr>
<tr>
<td><strong>Level 2</strong></td>
<td>Clinical experience allows linkage of signs and symptoms of a current patient to those encountered in previous patients. Still relies primarily on analytic reasoning through basic pathophysiology to gather information, but has the ability to link current findings to prior clinical encounters, and allows information to be filtered, prioritized, and synthesized into pertinent positives and negatives, as well as broad diagnostic categories.</td>
</tr>
<tr>
<td><strong>Level 3</strong></td>
<td>Demonstrates an advanced development of pattern recognition that leads to the creation of illness scripts, which allow information to be gathered while simultaneously filtered, prioritized, and synthesized into specific diagnostic considerations. Data gathering is driven by real-time development of a differential diagnosis early in the information-gathering process.</td>
</tr>
<tr>
<td><strong>Level 4</strong></td>
<td>Creates well-developed illness scripts that allow essential and accurate information to be gathered and precise diagnoses to be reached with ease and efficiency when presented with most pediatric problems, but still relies on analytic reasoning through basic pathophysiology to gather information when presented with complex or uncommon problems.</td>
</tr>
<tr>
<td><strong>Level 5</strong></td>
<td>Creates robust illness scripts and instance scripts (where the specific features of individual patients are remembered and used in future clinical reasoning) that lead to unconscious gathering of essential and accurate information in a targeted and efficient manner when presented with all but the most complex or rare clinical problems. These illness and instance scripts are robust enough to enable discrimination among diagnoses with subtle distinguishing features.</td>
</tr>
</tbody>
</table>
Background - The Pediatric Milestones

Challenges to use of milestones for assessment:

• Milestone sets were not intended to be used directly in assessment tools

• Normative data is not available

• There may be barriers to direct observation in busy clinical setting
Background – OSCE

Objective Structured Clinical Examinations (OSCE) are often used for competency assessment and formative feedback.

OSCE advantages for assessment of milestones include:

- Increased opportunities for observation
- Standardized patient encounters
- Ability to design encounters to evaluate specific competencies
Objective

To assess milestone attainment for end-of-year pediatric interns at two institutions via an OSCE using milestone sets as rating tools.
## Design - The OSCE

<table>
<thead>
<tr>
<th>SP &amp; parent - abdominal pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP &amp; parent - asthma</td>
</tr>
<tr>
<td>SP &amp; parent - well infant</td>
</tr>
<tr>
<td>SP &amp; parent - recent syncopal episode</td>
</tr>
</tbody>
</table>

**Telephone Triage - Parent of febrile infant**

- **Procedure** - Intraosseous line insertion
- **Procedure** - Intravenous line insertion
- **Handoff of three previous patients**
# Design - OSCE Blueprint

<table>
<thead>
<tr>
<th></th>
<th>PC 1</th>
<th>PC 4</th>
<th>PC 5</th>
<th>PC 6</th>
<th>PC 7</th>
<th>PC 9</th>
<th>PC 10</th>
<th>ICS 1</th>
<th>ICS 2</th>
<th>Prof 1</th>
<th>PB 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP - Abdominal pain</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent call - URI</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<td>✓</td>
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</tr>
<tr>
<td>SP – Asthma</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<td>✓</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SP - Well Baby</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>SP - Syncope</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tr>
</tbody>
</table>

PC – Patient care  
ICS – Interpersonal and communication skills  
Prof – Professionalism  
PBLI – Practice based learning and improvement  
SP – Standardized patient  
URI – Upper respiratory infection
## Design - The OSCE

<table>
<thead>
<tr>
<th>Duration</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 minutes</td>
<td>Patient evaluation</td>
</tr>
<tr>
<td>15 minutes</td>
<td>Written and verbal feedback</td>
</tr>
</tbody>
</table>

- Standardized patient checklist
- Faculty milestones rating form
- Face to face feedback based on milestones
Design – The OSCE

Reliability & Validity

• Cases developed by faculty with various areas of expertise
• Observable clinical skills rather than written items
• 4 hours
• Checklist format + validated tool for SP rating
• Original milestones language in the faculty rating tool
• Performed standard setting for faculty rating
• Assessed 8 of 11 competencies across multiple cases
Results

45 (90%) pediatric interns

32 milestone ratings per intern

1326 data points

<table>
<thead>
<tr>
<th>Competency</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC 1</td>
<td>176</td>
</tr>
<tr>
<td>PC 4</td>
<td>130</td>
</tr>
<tr>
<td>PC 5</td>
<td>130</td>
</tr>
<tr>
<td>PC 6</td>
<td>176</td>
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<tr>
<td>PC 7</td>
<td>179</td>
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<tr>
<td>PC 9</td>
<td>134</td>
</tr>
<tr>
<td>PC 10</td>
<td>44</td>
</tr>
<tr>
<td>PBLI 9</td>
<td>44</td>
</tr>
<tr>
<td>ICS 1</td>
<td>134</td>
</tr>
<tr>
<td>ICS 2</td>
<td>134</td>
</tr>
<tr>
<td>Prof 1</td>
<td>45</td>
</tr>
</tbody>
</table>
Results – Mean Milestone Attainment

Milestone Rating

Competency

PC 1  PC 4  PC 5  PC 6  PC 7  PC 9  PC 10  PBLI 9  ICS 1  ICS 2  Prof 1
Results – Mean Milestone Attainment

- **Physical exam**: 2.2 ± 0.6
- **Humanism**: 3.0 ± 0.8
Discussion

- Generated milestones performance data
  - Normative
  - Individual
  - Residency Program

- Utilized milestones directly as assessment tools

- Physical exam was competency with lowest mean

- Observation of a single encounter
Discussion – Future Directions

• Larger sample for normative data

• Validation of milestones sets as direct assessment tools through comparison with other performance evaluations

• Determination of inter-rater and inter-item reliability

• Consider including lower performing competencies in semi-annual reporting
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Children’s National Health System Simulation Learning Center
References


