Pediatric Cardiology Fellow Cardiac Morphology Curriculum: Assessing the Need

Lindsay Rogers MD, Melissa Klein MD, Jeanne James MD, and Michael Fitzgerald PhD

Introduction
Expert knowledge of cardiac anatomy is essential for the practice of pediatric cardiology. Current cardiac morphology training is heterogeneous among fellowships:
- Variable nomenclature
- Access to pathology specimens
- Faculty expertise

Potential problems with current education:
- Miscommunication between providers utilizing different nomenclature systems
- Missed/inaccurate anatomic diagnosis of congenital heart disease secondary to inadequate knowledge

Aims
Determine the current training practices, define effective curricula structure and evaluate preferences for a standardized fellowship cardiac morphology curriculum.

Methods
Study Design
Cross sectional descriptive survey study

Study Participants
ACGME accredited pediatric cardiology:
- Fellows & non-accredited fourth year fellows
- Program directors (PD) and Associate program directors (APD)

Study Design
- Two de novo surveys developed using Qualtrics™ online software (fellows and PD/APD)
- Survey sent via email over 3 week period

Results
101 Survey Responses
- 35 PD/APD from 32 Programs (54%)
- 66 Fellows (~16%)

Demographic Data

<table>
<thead>
<tr>
<th>Fellows (n=66)</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>38</td>
<td>58%</td>
</tr>
<tr>
<td>Female</td>
<td>28</td>
<td>42%</td>
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<tr>
<td>Current year in fellowship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>16%</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>30%</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>4 or greater</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Institutional program data (n=32)*</td>
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<tr>
<td>Total number of categorical fellows</td>
<td>1-3</td>
<td>9%</td>
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<tr>
<td>4-6</td>
<td>14</td>
<td>45%</td>
</tr>
<tr>
<td>7-9</td>
<td>9</td>
<td>28%</td>
</tr>
<tr>
<td>&gt;10</td>
<td>6</td>
<td>18%</td>
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<tr>
<td>Number of affiliated cardiology faculty</td>
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<td></td>
</tr>
<tr>
<td>6-10</td>
<td>5</td>
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<tr>
<td>11-15</td>
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<td>31%</td>
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<td>21-30</td>
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<tr>
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<td>9%</td>
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<tr>
<td>&gt;40</td>
<td>4</td>
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</tbody>
</table>

Program Primary Nomenclature
- 19% Andersonian (A)
- 25% Van Praagh (VP)
- 56% Combination (C)

Data Analysis
- Descriptive statistics for demographic data
- Mean data calculated using ANOVA
- Thematic coding of open-ended responses by two investigators

Potential clinical problems related to current education:
- Inadequate knowledge has potential patient safety implications: missed diagnosis & miscommunication
- Inadequate knowledge may lead to suboptimal patient outcomes

Clinical Impact of Inadequate Knowledge
- Patient safety issues
- Education

Effective Training
- Increased structured teaching (n=16)
- Improved access to heart specimens (n=8)
- Fellow protected time (n=10)

Training Improvement
- Hands on specimen exposure (n=14)

Program Director Assessment of Recent Fellow Graduate Skills
- ACGME satisfaction

Program Director Assessment of Current Curriculum Impact on Skills
- PD/APDs perceive some recent graduates as lacking adequate morphology knowledge

Thematic Responses from Fellows and PD/APD about Current Curriculum
- Fellows and PD/APDs identified areas for improvement
- Suggestions for standardized curriculum

Conclusion
Fellowship cardiology morphology teaching is heterogeneous
PD/APDs perceive some recent graduates as lacking adequate morphology knowledge
Inadequate knowledge has potential patient safety implications: missed diagnosis & miscommunication
Fellows and PD/APD expressed interest in an online cardiac morphology curriculum

Next Steps
Creation of a standardized and accessible cardiac morphology curriculum to provide a consistent educational platform, with continual curriculum evaluation and improvement assessment of fellow cardiology morphology competency.