Radiology’s FOCUS on POCUS – A Quality Improvement Mission

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Point-Of-Care-Ultrasound (POCUS)

- Brings US technology to the patient’s bedside
- Seen as “an extension of the clinical exam” in some situations
- In appropriate hands, may positively influence the care of patients
- Fraught with disparities in provider competence within our medical center
POCUS Disparity

- POCUS has become commonplace
- POCUS machines are readily available
- Providers have a desire or expectation to perform POCUS
- Providers are not necessarily confident in their ability to perform POCUS
- POCUS courses are expensive, brief and do not provide ongoing support or feedback
- Lack of ample personnel to provide structured POCUS education and training

Suboptimal and insufficient POCUS training
• Develop a scalable solution for the disparity in POCUS skills across our medical center.
- Interdepartmental collaborative effort to steer POCUS training
- Specific group of learners targeted i.e. Seven nephrology fellows
- Three key professionals – Radiologist, Nephrologist and Sonographer collaborated to create a curriculum for the fellows to be competent in performing and interpreting renal sonograms
- Four US workshops consisting of didactic lectures and hands-on scanning were delivered
- Pre- and post- tests were administered to document knowledge and learning

<table>
<thead>
<tr>
<th>#</th>
<th>Steps</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>7 Nephrology Fellows enrolled in educational pathway</td>
<td>Completed</td>
</tr>
<tr>
<td>2</td>
<td>4 ultrasound workshops consisting of hands-on scanning and didactic lectures delivered</td>
<td>Completed</td>
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<tr>
<td>3</td>
<td>Pre- and post-tests administered to document knowledge and learning</td>
<td>Completed</td>
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<tr>
<td>4</td>
<td>After completing workshops, Nephrology Fellows encouraged to undertake POCUS scanning and capture images for review by Radiologist</td>
<td>Ongoing</td>
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<tr>
<td>5</td>
<td>Nephrology Fellows to observe Radiologist within Abdominal Radiology reading room</td>
<td>Ongoing</td>
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Ultrasound Workshops

1. Basic physics, ultrasound safety and tissue characteristics
2. Renal sonographic anatomy and techniques; Normal variants
3. Commonly encountered renal pathologies
4. IVC sonography and fluid status

Sample test question:
Which statement is correct regarding ultrasound gel?

a. It has been linked to several outbreaks of bacterial infection ★

b. Once warmed, is less likely to cause infection

c. Does not promote survival of bacteria since all ultrasound gel must contain bactericidal compounds

Sample image from lecture:
Sagittal image of the left kidney showing “shadowing” calculus within renal pelvis.
Excellent interdepartmental engagement and collaboration

Post-test scores improved from an average of 51.1% to 76.5% (p < 0.001)

<table>
<thead>
<tr>
<th>Session</th>
<th>Average Scores Pre-Workshop</th>
<th>Average Scores Post-Workshop</th>
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<tbody>
<tr>
<td>1</td>
<td>36%</td>
<td>79%</td>
</tr>
<tr>
<td>2</td>
<td>40%</td>
<td>79%</td>
</tr>
<tr>
<td>3</td>
<td>62%</td>
<td>74%</td>
</tr>
<tr>
<td>4</td>
<td>68%</td>
<td>74%</td>
</tr>
<tr>
<td>Total Average Scores</td>
<td>51.5%</td>
<td>76.5%</td>
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</table>

Average test scores of 7 Nephrology Fellows before and after workshop instruction
Results

- Nephrology fellows obtained renal sonograms using POCUS equipment and presented their images for appraisal by the Radiologist.
- Opportunity for one-on-one feedback.
- Results in appreciation of safe boundaries of practice within a POCUS framework.
Radiology can play a role in the implementation and practice of POCUS. Key components for scalable success include:

1. Identifying a target group of learners
2. Developing a curriculum for learners based on collaboration with the experts within the learner’s specialty
3. Engaging Radiologists and Sonographers to provide didactic teaching and hand-on workshops, respectively
4. Providing ongoing evaluation and feedback
Thank you!

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