**Use of Imaging in the Workup of Pediatric Appendicitis Semi-Structured Interview Guide Questions V5**

*Italicized questions represent possible prompts should the interviewee not address that topic or something similar.*

**Introduction – Low Performer/High Outlier (2min)**

The behavior of interest for today’s discussion is the judicious use of imaging in the workup of suspected appendicitis specifically regarding the minimization of Computerized tomography (CT) imaging usage. You are low performer, and we wish to understand that challenges you face to reducing CT usage with the aim of identifying potential solutions learned for similar institutions that are high performers.

**Introduction – High Performer/Low Outlier (2min)**

The behavior of interest for today’s discussion is the judicious use of imaging in the workup of suspected appendicitis specifically regarding the minimization of Computerized tomography (CT) imaging usage. You are a high performer, and we wish to identify the institutional systems in place to reduce CT usage and how they can be applied to lower performers.

**Demographic Questions (5min)**

1. Can you describe your pediatric surgery group and the healthcare system in which they operate?
   a. If multiple sites which sites participate in NSQIP-P? Is data on CT usage from OSH being included by your SCRs in NSQIP-P?
   b. How large is the pediatric surgery department?

2. What are general demographic qualities of the patient population your practice operates in?
   a. What percentage of the population is covered by Medicaid?

**Diagnostic Imaging Questions (25 minutes)**

1. A patient presents to your institution that contributes to NSQIP-P with suspected appendicitis. How is diagnostic imaging utilized in the workup of appendicitis at your institution? (Patients presenting at OSH and transferred in do not count toward NSQIP-P)
   a. When is imaging used? Why?
   b. Who makes decisions on the use of imaging? Why? Do you agree with their decision?
   c. Does a protocol exist addressing imaging use in the workup of suspected appendicitis? Is it followed? If not, why does one not exist?
   d. Are any scoring systems used to aid in the decision to use diagnostic imaging?

2. At your institution what is the typical first line imaging modality used? Why this modality and not others? E.g. If CT is first line, why not Ultrasound (US) or Magnetic Resonance Imaging (MRI)
   a. Do any patient factors affect this decision? E.g. Obesity, concern for complicated appendicitis, Pt compliance with certain modalities
   b. Is there significant risk to using CT in pediatric patients? Does evidence surrounding risks associated with CT affect this decision? What circumstances justify the risk?
c. What environmental/systemic reasons affect this decision? E.g. Modality availability, ease of interpretation

d. How does timing affect this decision? E.g. Patient presents out of hours or potential delays in care

e. How does cost influence this decision?

f. Does the institution incentivize or disincentivize any specific modality?

g. How have the views of others (E.g. colleagues, mentors, professional groups) influenced this decision?

h. Is there significant variation in imaging practices across your colleagues in the department?

3. If initial imaging is nondiagnostic what are the typical next steps in the care of the patient?

a. Is another imaging modality then subsequently used? Why or why not?

b. Are observation periods used?

4. Are periods of observation utilized in the workup of suspected appendicitis? In what scenarios are they used?

a. How long are patients observed for and in what setting?

b. Is another imaging modality then subsequently used? Why or Why not? E.g. If US nondiagnostic is CT/MRI then used?

5. What factors encourage/dissuade US use in the workup of suspected appendicitis at your institution?

a. Is US consistently available for use?

b. What patient factors affect US use? E.g. Obesity or patient tolerance

c. Who is performing the US? E.g. Is it a dedicated pediatric technician?

d. Is there a standardized approach to US technique in the workup of appendicitis? E.g. Standardized number of attempts, pain control, bladder filling

e. Is there a standardized method in which US for appendicitis are read?

f. How much confidence is typically placed in the US result by the pediatric surgery team?

6. What factors encourage/dissuade MRI use in the workup of suspected appendicitis at your institution?

a. Is MRI consistently available?

b. Are there any patient factors that affect MRI use? E.g. Pt preference/tolerance/sedation?

c. Does a specific MRI protocol exist at your institution when used for suspected appendicitis? E.g. A/P vs RLQ

d. How efficient is MRI at your institution?

e. What is the degree of comfort with the use of MRI for suspected appendicitis?

f. Does cost impact the use of MRI?

7. What prompts the use of CT in the workup of a patient with suspected appendicitis at your institution?

a. Under what circumstances is CT used as first line imaging modality?
8. What needs to be done differently to reduce the use of CT at your institution while maintaining the accurate diagnosis of appendicitis?
   a. Good Performer - If you had to rank the top 3 things that contributed to your success in reducing CT usage what would they be?
   b. Poor Performer - If you had to rank the top 3 obstacles preventing your success in reducing CT usage what would they be?
   c. What advice would you give to institutions trying to decrease preoperative CT utilization?

9. When is diagnostic imaging used in the postoperative phase and what imaging modality is typically used? Why?
   a. In general, which patients receive postoperative imaging to rule out abscess?
   b. Does a standardized protocol exist to determine who gets postoperative imaging?
   c. What objective data (WCC, Postoperative day, Fevers) influence postoperative imaging decisions?
   d. What is the imaging modality of choice?

Quality Improvement Questions (25 min)

10. Has your institution recognized ionizing radiation reduction as an important issue? Has there been commitment to reduce CT use?
   a. Which departments are involved in this discussion? (EM, radiology, peds surgery)
   b. What multidisciplinary efforts have been made to reduce CT usage? What facilitates/inhibits this?
   c. Has any department or practitioner accepted responsibility for minimizing CT use?
   d. Where does the issue of CT usage reduction fall on the list of priorities of different specialties? EM, Radiology, Pediatric Surgery
   e. What % of your physicians in [EM, radiology, peds surgery] think this is an important issue?
   f. Do you have a peds radiology champion? What efforts have they undertaken to reduce CT use?
   g. Do you have multidisciplinary meetings to discuss imaging results and usage? Are they regular and well attended?

11. Do you feel that your administration supports quality improvement? Do you feel that there is administration support for CT reduction?
   a. In what ways has the stance of admin encouraged efforts to reduce CT use? Hindered efforts?
   b. Have there been requests made to admin to provide more resources? What types of resources? How have these requests been received?
   c. Where do you think CT reduction falls on the list of admin priorities?
   d. What tactically might be required from admin to support CT reduction?

12. Can you describe the institutional culture towards quality improvement? What factors have precipitated this culture?
a. Are people open to changes in practice that come from quality improvement initiatives?
b. What other attempts at quality improvement have been successful?
c. Are there regular well attended multidisciplinary quality improvement meetings?
d. Are there institutional organizations dedicated solely to quality improvement?
e. Is there adequate leadership in the realm of quality improvement?
f. How have professional relationships affected this culture?

13. Do you have any final thoughts?
<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Lack of awareness/incorrect ideas surrounding dangers of CT</th>
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<tbody>
<tr>
<td></td>
<td>Lack of awareness/incorrect ideas surrounding the indications/benefits/risks of alternative imaging (US/MRI)</td>
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<td></td>
<td>Unaware of professional society guidelines surrounding the issue</td>
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<td>Lack of familiarity with alternative imaging modalities</td>
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<td>Skills</td>
<td>Familiarity and experience with the use and reading of alternative imaging modalities</td>
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<td>Skills in counselling patients on the use of US/MRI</td>
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<td>Ultrasound technician skill</td>
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<td>Comfort of radiologist with different modalities</td>
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<td>Social/Professional Identity</td>
<td>ED has different ideas regarding imaging modalities. Conflict as to who orders imaging.</td>
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<td>Beliefs about capabilities</td>
<td>Belief that CT is necessary to diagnose appendicitis</td>
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<td>Belief that MRI does not provide enough benefit to outweigh the cost and time requirement</td>
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<td>Beliefs surrounding child’s ability to tolerate MRI</td>
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<td>Beliefs surrounding diagnostic capability of US</td>
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<td>Beliefs about Consequences/Reinforcements</td>
<td>Potential litigation if missed diagnosis</td>
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<td>Harm to patient by missing diagnosis with US outweighs risks of CT</td>
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<td>Any systemic incentives/disincentives for CT usage</td>
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<td>Beliefs surrounding costs of modality</td>
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<td>Intentions/Goals</td>
<td>Using MRI increases time to surgery or other aspects of care</td>
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<td>US can be non diagnostic and therefore delays care of the patient</td>
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<td>Memory, attention, Decision points</td>
<td>Lack protocols regarding imaging modality choice in suspected appendicitis</td>
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<td>Suspicion for complicated appendicitis may lead to higher usage of CT</td>
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<td>Environmental context &amp; resources</td>
<td>Lack of availability of US or MRI</td>
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<td>Changes in resource availability overnight</td>
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<td>Ultrasound technician</td>
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<td>MRI is costly</td>
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<td>Social Influences</td>
<td>Willingness of patients/parents to undergo MRI vs CT</td>
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<td>Provider training emphasized CT</td>
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<td>Practice of your partners/mentors</td>
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<tr>
<td>Emotion</td>
<td>Fear of incorrect diagnosis or harming pt.</td>
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