

Interview questions: determinants of blood culture overuse in the pediatric intensive care unit

You are being asked to take part in this voluntary research study because you are a clinician (doctor, nurse, or advanced practice provider) working in the pediatric intensive care unit (PICU) in a patient care role.

This is a research study to learn more about how PICU clinicians think about, and make decisions about, diagnostic testing for infections in PICU patients. Specifically, we are interested in understanding how you think about using blood cultures to test patients for bacteremia or sepsis when they are in the PICU.

You will be asked to answer questions via telephone for a period of 30-45 minutes, one time. These interviews will be recorded, then transcribed and analyzed by the University of Pennsylvania Mixed Methods Research Laboratory. After the interview, we will note your name, age, your place of employment, type of employment (eg, nurse, fellow, attending physician), years of work experience, and email address for our internal records.

The main risks of this study are the potential for loss of privacy or confidentiality if any of the interview content is either inadvertently shared outside the study team or if the interview content were to be linked to an identifiable participant rather than remain anonymous. We do not plan to share any interview material with anyone outside of the study team, and will keep your identity protected and confidential so your answers cannot be linked back to you, except by members of the study team and only for study organization purposes.

You will not benefit directly from participating in this study. You will receive a \$100 bankcard to thank you for your time and participation. If you accept payment using a bankcard, the bank will have access to identifiable information and some of your information is available to third-party vendors. The bank will not have access to any medical information.

If there is anything that we have described that you do not understand, please ask questions. Please take your time. There are no wrong or right answers to these questions. You do not have to take part in this study if you do not want to. If you take part, you can leave the study at any time, including stopping before the interview is completed. Choosing to participate or not participate will not have any impact on any component of the Bright STAR project or on your role as a clinician in the PICU at your site. Neither your performance evaluation nor your employment will be affected. Your interview responses will not be shared with your supervisors.

Completion of this interview implies consent to participate.

Do you have any questions for me about what it means to participate in this study?

Before we start, I'd like to confirm that you are okay with recording this conversation. Is this correct? (*Pause for confirmation*). Recording the interview is to make sure that I don't miss anything you say. I may also take a few notes while we talk.

Interview Questions

1. To start off with, tell me about your role in the PICU and briefly how that role relates to blood cultures.

Prompt:

For example, do you order cultures? Do you collect cultures?

These next few questions focus on the process, decisions, and steps you might take when ordering a blood culture for a PICU patient.

2. Walk me through what happens when a PICU patient has a fever – what your thought process is, what diagnoses you might consider, and what actions you take or put into place.

Prompts:

- a. What are the most common causes of fever that you see in PICU patients?
- b. What are less common causes of fever?
- c. Tell me about one diagnosis or scenario that worries you more than the others for a febrile PICU patient.
- d. What tests or treatments might you order?

3. Describe your personal threshold for deciding that bacteremia is possible and a blood culture should be ordered.

Prompts:

- a. On a scale from 1-10, how suspicious do you need to be that a patient has bacteremia for you to order a blood culture? 1 being that you have no idea, 10 being that you're absolutely certain.
- b. What specific symptoms usually trigger someone to get a blood culture?
- c. What steps are taken in order to make the decision to order a blood culture?

4. Consider the “typical” or “standard” practice related to blood cultures in your PICU (either formal like an algorithm or informal like a “usual practice style”). Can you describe that for me?

Prompts:

- a. Does your unit have an algorithm or guideline for blood cultures?
 - a. [If yes] Tell me about the algorithm.

[if participant can't report a standard practice] If there isn't a “typical” practice, discuss that here instead.

5. How does your personal clinical approach to a PICU patient with a fever compare to that overall practice [described in question 4]?

[SKIP if participant can't report a standard practice]

Prompt:

- a. [if they described a standard practice in question 4] How often do you follow your unit's algorithm or guideline?
- b. In what circumstances might you deviate from it?

6. If another clinician feels strongly that a blood culture should or should not be ordered, how does that impact your decision to order one?

Prompts:

- a. Have you ever ordered a blood culture primarily because another clinician (ex: consultant, or another PICU doctor) wanted one?
- b. **[if subject is a trainee, eg resident or fellow; or nurse practitioner]:** have you ever ordered a blood culture because you thought someone more senior than you, such as your fellow or attending, would want one?

7. *[lower priority question, could skip if interview running long]* How do the expectations of a patient's family members impact your decisions about blood cultures?

8. *[lower priority question, could skip if interview running long]* How it is decided how many blood culture samples are needed from a patient, and what source those samples should come from? For example, if it should be peripheral venipuncture, or one culture from a central line, or cultures from every lumen of a central line?

9. Tell me how the approaches to blood culture decisions change with things like day shifts versus night shifts, or when you have a full census in the PICU versus a smaller number of patients.

10. Tell me about any projects or initiatives focusing on sepsis or antibiotic administration going on in your PICU.

Prompt if needed - For example, are there sepsis alerts in your unit, or goals for getting antibiotics administered within a certain time frame?

If they say yes, try to ask this to everyone - How has that work impacted how decisions about blood cultures get made in your PICU?

Now I'd like to ask you about blood culture results in the PICU.

11. Data shows that about 5-15% of blood cultures sent are actually positive for bacteria, and up to half of those represent contaminants (vs true pathogens). What do you think about those numbers?

Prompts:

- a. Do they seem high? Or low?
- b. Do they surprise you?

Next, I'd like to focus a little more on sepsis.

12. Now, walk me through a case where you took care of a patient with bacterial sepsis (not just a fever). What were their presenting symptoms?

Prompts:

- a. Was it clear right away that they were septic, or did that become clear after tests were done or results came back?
- b. How sick were they? (ex: needing a ventilator? Vasopressors? Etc)

13. Have you personally experienced taking care of a patient who experienced a negative outcome from confirmed bacterial sepsis (such as death, disability, prolonged ICU course, etc)?

[If yes] How did that experience impact how you make decisions about getting blood cultures in subsequent PICU patients?

[If no] Have you taken care of patients who had positive outcomes after confirmed bacterial sepsis?

[if yes] Did that experience impact how you make decisions about getting blood cultures in PICU patients?

14. How do you think about the risks vs benefits of obtaining a blood culture in a PICU patient?

Probing questions:

- What do you gain by sending a blood culture?
- What negative consequences might occur?

15. How do you think about the risks/benefits of NOT obtaining a blood culture in a PICU patient?

Probing questions:

- What do you lose by NOT sending a blood culture?
- What positive consequences might occur?

16. Thinking about the risks and benefits of either sending or NOT sending a blood culture, what factors are *most* important in your decision making process when deciding whether or not to send for a blood culture?

[*if not addressed*] Ultimately, how do those factors impact the decision you make (to send or not send a culture)?

Now I have three hypothetical questions for you.

17. If I tell you “a PICU patient has a fever, and the clinical team decided to monitor without taking other action” – what goes through your mind?

Prompts:

- a. Can you describe a time when you made a similar decision?
- b. In what situation could this be the correct decision?
- c. What could go wrong in that scenario?

18. If I tell you that “a PICU patient has a fever, and you decide to monitor without taking other action, and six hours later, the patient develops new tachycardia and hypotension” – what goes through your mind?

- a. Might you regret your initial decision?
- b. Has this ever happened to you in real life?

19. Finally, let’s say you are working your next shift, after the last hypothetical situation I described where your PICU patient had a fever, you decided to monitor without taking other action, but they eventually developed tachycardia and hypotension. Now another, different patient has a fever.

How do you think your approach and threshold for testing with a blood culture might be impacted by the prior events?

- a. Would you be more likely to test for infection with a blood culture?

Finally, I have two quick one-word answer questions to wrap up with:

20. Does OVERUSE or UNDERUSE of tests/treatments present a greater risk to PICU patients?

21. Do you think PICU clinicians OVERUSE or UNDERUSE blood cultures in PICU patients?

That’s all I have. Is there any other information you would like to share regarding blood culture practices?

What else do you think I should be asking you about?

[*turn recorder off*]

[demographic questions]

1. How many years have you been a practicing PICU clinician, after you completed training (or school if you are still in training)? _____
2. Do you plan to spend a majority of your future clinical time in a PICU setting? Yes No Maybe
3. Do you mainly work day shifts, night shifts, or both? Days Nights Both
4. What is your age? _____
5. What best describes your gender? Male Female Prefer not to disclose
6. Do you identify as Hispanic and/or Latino(a)? Yes No Prefer not to disclose
7. What best describes your race? you can choose more than one:
- | | |
|--|---|
| <input type="checkbox"/> American Indian/Alaska Native | <input type="checkbox"/> White |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Multiple Races |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Native Hawaiian or Other Pacific Islander | <input type="checkbox"/> Prefer not to disclose |

DOB:

Mailing address: