

Survey on the Current Status of Vascular Access Skills Training in Standardized Residency Training for Anesthesiology Residents in Eastern China

Dear Participant,

Hello! Thank you for taking the time to participate in this survey.

I. Research Purpose

This survey aims to assess the current state of vascular access skills training among anesthesiology residents in Eastern China. It focuses on the use of ultrasound-guided and landmark-based techniques, training outcomes, and trainee and faculty perspectives, with the goal of informing future improvements to the training curriculum.

II. Survey Population and Version Description

This questionnaire is divided into two versions: the “Resident Version” and the “Faculty Version”. Please choose the corresponding version to answer based on your identity:

- Resident Version: Applicable to current residents in training at any grade level, as well as trainees who have completed their training within the past three years.
- Faculty Version: Applicable to supervising physicians responsible for teaching residents in standardized residency training programs.

 **Reminder:** This questionnaire is only intended for the two groups mentioned above. If you do not belong to either category of survey subjects, please exit this questionnaire. Thank you for your understanding and support!

III. Instructions for Completion

This questionnaire is anonymous and is expected to take approximately 6 minutes to complete. There are no standard answers to any question; please answer truthfully based on your actual experiences and thoughts.

IV. Confidentiality and Data Use Statement

All data collected in this survey will be used solely for academic research. Research results will be presented in aggregate statistical form, and no personal identifying information will be disclosed. We will strictly comply with relevant laws, regulations, and academic ethics standards to keep your personal information strictly confidential. Survey data will be managed by dedicated research team personnel, used only for research purposes, and will not be provided to any third party.

V. Voluntary Participation Principle

Your participation in this survey is entirely voluntary. You have the right to withdraw from the survey at any time, without providing a reason, and without bearing any adverse consequences. Submitting the questionnaire implies that you have fully understood the above information and agree to participate in this study.

Please confirm your identity and select the corresponding version:

- ☐ I am a resident (in training or graduated within the past three years), have read and understood the above content, and voluntarily participate in this survey. → Go to Resident Version
- ☐ I am a teaching faculty member, have read and understood the above content, and voluntarily participate in this survey. → Go to Faculty Version
- ☐ I do not belong to either of the above categories of survey subjects. → Prompt: "Thank you for your interest! This questionnaire is only for anesthesiology residents and teaching faculty. You do not need to continue. Thank you again for your support!" → End questionnaire automatically

If you have any questions about this study, please feel free to contact the study coordinator: Liu Enci (Contact: 13626746673)

Please select your identity

1. Please select your identity [Single-choice question]

- Resident Version Questionnaire
- Faculty Version Questionnaire (Automatically skip to question 28)

Resident Version

2. Name of your residency training base: [Fill-in-the-blank]

3. Province/Municipality where you are located: [Fill-in-the-blank]

4. Your gender: [Single-choice question]

☐ Male

☐ Female

5. Your age: [Fill-in-the-blank]

_____ years old

6. Which year of standardized residency training are you currently in? [Single-choice question]

☐ First year

☐ Second year

☐ Third year

☐ Graduated

7. Have you obtained the "Standardized Residency Training Certificate"?
[Single-choice question]

☐ Yes

☐ No

8. Level of your current hospital: [Single-choice question]

☐ Tertiary Grade A

☐ Tertiary Grade B

☐ Secondary Grade A

☐ Secondary Grade B

☐ Other

9. How would you rate the availability of ultrasound equipment in your base during peak usage periods? [Single-choice question]

☐ Very sufficient

☐ Sufficient

☐ Neutral

☐ Insufficient

☐ Severely insufficient

[Instruction]: Vascular access below specifically refers to internal jugular vein or radial artery catheterization.

10. Have you received training in the landmark-based (blind) technique for vascular access? [Matrix single-choice question] Please select one response per row

| Yes | No |

Internal Jugular Vein | ☐ | ☐ |

Radial Artery	☐	☐	
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11. Have you received training in ultrasound-guided vascular access? [Matrix single-choice question] Please select one response per row

Yes	No	
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Internal Jugular Vein	☐	☐	
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Radial Artery	☐	☐	
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12. When you initially learned vascular access, which method did you use? [Matrix single-choice question] Please select one response per row

Blind Technique	Ultrasound Guidance	
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Internal Jugular Vein	☐	☐	
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Radial Artery	☐	☐	
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13. Which method do you prefer for the following procedures? [Matrix single-choice question] Please select one response per row

Ultrasound Guidance	Blind Technique	
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Internal Jugular Vein	☐	☐	
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Radial Artery	☐	☐	
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14. In your opinion, which puncture method receives more emphasis in your current training? [Single-choice question]

- Ultrasound guidance
- Landmark-based technique
- Both are equally emphasized

15. Have you ever worked in a primary-level hospital (e.g., county hospital, township health center) and performed vascular access there? [Single-choice question]

- Yes
- No (Automatically skip to question 17)

16. If you have primary-level hospital work experience, please describe the main challenges: [Multiple-choice question]

- ☐ No ultrasound equipment / difficult to access
- ☐ Not proficient in ultrasound-guided puncture
- ☐ Not proficient in landmark-based puncture
- ☐ Poor patient vascular conditions
- ☐ Lack of timely guidance from senior physicians
- ☐ Other (please specify) _____

[Confidence Assessment (1 = Very unconfident, 5 = Very confident)]

17. How would you rate your confidence when performing the following procedures using the blind technique? [Matrix single-choice question] Please select one response per row

	1	2	3	4	5

Internal Jugular Vein	☐	☐	☐	☐	☐	
Radial Artery	☐	☐	☐	☐	☐	

18. How would you rate your confidence when performing the following procedures using the blind technique in emergency surgeries? [Matrix single-choice question]
Please select one response per row

| 1 | 2 | 3 | 4 | 5 |

Internal Jugular Vein	☐	☐	☐	☐	☐	
Radial Artery	☐	☐	☐	☐	☐	

19. How would you rate your confidence when performing the following procedures using the blind technique in obese patients? [Matrix single-choice question] Please select one response per row

| 1 | 2 | 3 | 4 | 5 |

Internal Jugular Vein	☐	☐	☐	☐	☐	
Radial Artery	☐	☐	☐	☐	☐	

20. How would you rate your confidence when performing the following procedures using ultrasound guidance? [Matrix single-choice question] Please select one response per row

| 1 | 2 | 3 | 4 | 5 |

Internal Jugular Vein	☐	☐	☐	☐	☐	
Radial Artery	☐	☐	☐	☐	☐	

[Number of Attempts]

21. In most cases, how many attempts are required for successful puncture when using the blind technique for the following procedures? [Matrix single-choice question] Please select one response per row

| 1 attempt | 2 attempts | 3 attempts | ≥ 4 attempts |

Internal Jugular Vein	☐	☐	☐	☐
Radial Artery	☐	☐	☐	☐

22. In most cases, how many attempts are required for successful puncture when using ultrasound guidance for the following procedures? [Matrix single-choice question] Please select one response per row

| 1 attempt | 2 attempts | 3 attempts | ≥ 4 attempts |

Internal Jugular Vein	☐	☐	☐	☐
Radial Artery	☐	☐	☐	☐

[Frequency of Requesting Assistance]

23. How often do you request assistance from a senior physician when performing the following procedures using the blind technique? [Matrix single-choice question] Please select one response per row

| Often | Sometimes | Rarely | Never |

Internal Jugular Vein	☐	☐	☐	☐	
Radial Artery	☐	☐	☐	☐	

24. How often do you request assistance from a senior physician when performing the following procedures using ultrasound guidance? [Matrix single-choice question]
Please select one response per row

	Often Sometimes Rarely Never				
Internal Jugular Vein	☐	☐	☐	☐	
Radial Artery	☐	☐	☐	☐	

25. Do you believe the landmark-based (blind) technique is still necessary in contemporary anesthesia practice? [Single-choice question]

- ☐ Very necessary
- ☐ Necessary
- ☐ Neutral
- ☐ Unnecessary
- ☐ Completely unnecessary

26. Are you worried about being unable to perform vascular access competently when working in a hospital without ultrasound equipment? [Single-choice question]

- ☐ Very worried
- ☐ Worried
- ☐ Neutral
- ☐ Not worried

- Not worried at all

27. Do you support strengthening blind technique training during residency? [Single-choice question]

- Strongly support
- Support
- Neutral
- Oppose
- Strongly oppose

Faculty Version

28. Name of your residency training base: [Fill-in-the-blank]

29. Province/Municipality where you are located: [Fill-in-the-blank]

30. Your professional title: [Single-choice question]

- Chief Physician
- Associate Chief Physician
- Attending Physician
- Resident Physician

31. Your gender: [Single-choice question]

- ☐ Male
- ☐ Female

32. Your age: [Fill-in-the-blank]

_____ years old

33. Years of teaching experience: [Single-choice question]

- ☐ ≤ 5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ ≥ 16 years

34. What is the ratio of operating rooms to ultrasound equipment in your hospital?
[Single-choice question]

- ☐ Dedicated equipment per OR (1:1)
- ☐ One machine shared by 2-3 ORs
- ☐ One machine shared by 4-5 ORs
- ☐ One machine shared by 6-7 ORs
- ☐ One machine shared by 8 or more ORs
- ☐ No ultrasound equipment

[Instruction]: Vascular access below specifically refers to internal jugular vein or radial artery catheterization.

35. In your teaching activities regarding vascular access procedures, which method do you prefer to use? [Matrix single-choice question] Please select one response per row

	Blind Technique	Ultrasound Guidance
Internal Jugular Vein	☐	☐
Radial Artery	☐	☐

36. Do you emphasize the importance of blind technique proficiency in your teaching? [Single-choice question]

- ☐ Always
- ☐ Often
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

37. Are there dedicated training courses for the blind technique in vascular access?[Matrix single-choice question] Please select one response per row

	Yes, dedicated course	No, clinical teaching only
Internal Jugular Vein	☐	☐
Radial Artery	☐	☐

38. Are there dedicated training courses for ultrasound-guided vascular access?

[Matrix single-choice question] Please select one response per row

	Yes, dedicated course	No, clinical teaching only
Internal Jugular Vein	☐	☐
Radial Artery	☐	☐

39. Do you think it is necessary to establish specialized training courses for the blind technique? [Single-choice question]

- ☐ Very necessary
- ☐ Moderately necessary
- ☐ Neutral
- ☐ Not very necessary
- ☐ Completely unnecessary

[Instruction]: For questions 40-4 2, please rate the actual abilities of your trainees (1 = Very poor, 5 = Very good)

40. Please rate your trainees' ability to perform vascular access using the blind technique (1=Very poor, 5=Very good): [Matrix single-choice question] Please select one response per row

	1 score	2 scores	3 scores	4 scores	5 scores
Internal Jugular Vein	☐	☐	☐	☐	☐

Radial Artery	☐	☐	☐	☐	☐
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41. Please rate your trainees' ability to perform vascular access using ultrasound guidance (1=Very poor, 5=Very good): [Matrix single-choice question] Please select one response per row

1 score	2 scores	3 scores	4 scores	5 scores
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Internal Jugular Vein	☐	☐	☐	☐	☐
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Radial Artery	☐	☐	☐	☐	☐
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42. Compared to trainees from five years ago, how would you rate the blind technique skills of recent graduates? [Single-choice question]

- ☐ Significantly declined
- ☐ Moderately declined
- ☐ About the same
- ☐ Moderately improved
- ☐ Significantly improved

43. Do you experience psychological dependence on ultrasound when performing vascular access procedures? [Matrix single-choice question] Please select one response per row

Yes, dependent	No, not dependent
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Internal Jugular Vein	☐	☐	
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Radial Artery	☐	☐	
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44. In your opinion, is it necessary for anesthesiologists today to be proficient in the blind technique for vascular access? [Single-choice question]

- ☐ Very necessary
- ☐ Necessary
- ☐ Not very necessary
- ☐ Unnecessary
- ☐ Completely unnecessary

45. Are you concerned that the trainees you teach might encounter difficulties when working in hospitals lacking ultrasound equipment in the future? [Single-choice question]

- ☐ Very concerned
- ☐ Moderately concerned
- ☐ Neutral
- ☐ Not very concerned
- ☐ Not concerned at all

46. Are trainees formally assessed on their ultrasound-guided vascular access skills? [Matrix single-choice question] Please select one response per row

	Yes, assessed	No, not assessed	
Internal Jugular Vein	☐	☐	
Radial Artery	☐	☐	

47. Would you support adding an assessment component for "completing vascular access under ultrasound guidance" in the final residency certification exam? [Single-choice question]

- ☐ Strongly support
- ☐ Support
- ☐ Neutral
- ☐ Oppose
- ☐ Strongly oppose

48. In your opinion, what are the shortcomings of the current standardized residency training system in "preparing trainees to adapt to environments with different resources"? (Multiple choices allowed) [Multiple-choice question]

- ☐ Over-reliance on high-end equipment in teaching
- ☐ Insufficiently systematic curriculum
- ☐ Lack of targeted simulation training
- ☐ Faculty's own mindset emphasizing ultrasound over blind technique
- ☐ Insufficient training time
- ☐ Uneven distribution of teaching resources
- ☐ Other (please specify) _____

中国东部地区麻醉科住院医师规范化培训血管穿刺技能培训现状调查

尊敬的参与者：

您好！感谢您抽出宝贵时间参与本次调查。

一、研究目的

本调查旨在了解中国东部地区麻醉科住院医师在血管穿刺技能培训方面的现状，涵盖超声引导与体表标志法的使用情况、培训效果及认知态度，为进一步优化培训体系提供参考依据。

二、调查对象与版本说明

本问卷分为住培医师版和导师版两个版本，请根据您的身份选择相应版本作答：住培医师版：适用于目前在培的各年级住院医师，以及近三年内结业的学员。导师版：适用于承担住院医师规范化培训带教任务的指导教师。

 温馨提示：本问卷仅面向上述两类人群。若您不属于以上任何一类调查对象，烦请退出本问卷，感谢您的理解与支持！

三、填写说明

本问卷采用匿名方式填答，预计耗时约 6 分钟。所有题目无标准答案，请根据您的真实经历和想法如实作答。

四、保密与数据使用声明

本调查收集的所有数据 仅用于学术研究，研究结果将以整体统计形式呈现，不会公开任何个人身份信息。我们将严格遵守相关法律法规及学术伦理规范，对您的个人信息予以严格保密。调查数据将由研究团队专人管理，仅限研究用途，不会提供给任何第三方。

五、自愿参与原则

您参与本调查完全出于自愿。您有权在任何时候、无需说明理由退出调查，且不会因此承担任何不利后果。提交问卷即视为您已充分了解上述信息并同意参与本研究。

请确认您的身份并选择相应版本：

☐ 我是住培医师（在培或近三年内结业），已阅读并理解以上内容，自愿参与本次调查。 → 进入住培医师版

☐ 我是住培带教导师，已阅读并理解以上内容，自愿参与本次调查。 → 进入导师版

☐ 我不属于上述任何一类调查对象。 → 提示："感谢您的关注！本问卷仅面向麻醉科住培医师及带教导师，您无需继续填写。再次感谢您的支持！" → 自动结束问卷

如您对本研究有任何疑问，欢迎联系研究负责人：刘恩慈（联系方式：13626746673）

请选择您的身份

1. 请选择您的身份 [单选题]

☐ 住培医生版问卷

☐ 导师版问卷（自动跳至第 28 题）

住培医生版

2. 您所在的住培基地名称： [填空题]

3. 您所在的省份/直辖市： [填空题]

4. 您的性别： [单选题]

☐ 男

☐ 女

5. 您的年龄： [填空题]

6. 您当前处于规培的第几年： [单选题]

☐ 第一年

☐ 第二年

☐ 第三年

☐ 已结业

7. 您是否已取得《住院医师规范化培训合格证书》： [单选题]

☐ 是

☐ 否

8. 您目前所在医院的级别： [单选题]

☐ 三级甲等

☐ 三级乙等

☐ 二级甲等

☐ 二级乙等

☐ 其他

9. 您所在基地的超声设备在使用高峰期可用性如何？ [单选题]

☐ 非常充足

☐ 充足

☐ 一般

☐ 不足

☐ 严重不足

[说明]： 以下血管穿刺特指颈内静脉或桡动脉穿刺置管术

10. 您接受过体表标志法（盲穿法）血管穿刺培训吗？ [矩阵单选题]

是 否

颈内静脉穿刺 ☐ ☐

桡动脉穿刺 ☐ ☐

11. 您接受过超声引导下血管穿刺培训吗？ [矩阵单选题]

是 否

颈内静脉穿刺 ☐ ☐

桡动脉穿刺 ☐ ☐

12. 在您最初学习血管穿刺时，使用的哪种方法？ [矩阵单选题]

盲穿法 超声引导

颈内静脉穿刺 ☐ ☐

桡动脉穿刺 ☐ ☐

13. 您在以下操作时，优先选择哪种方式？ [矩阵单选题]

超声引导 盲穿法

颈内静脉穿刺 ☐ ☐

桡动脉穿刺 ☐ ☐

14. 您认为哪种穿刺方法在您目前的培训中更受重视？ [单选题]

☐ 超声引导

☐ 体表标志法

☐ 两者均衡

15. 您是否在基层医院（如县医院、乡镇卫生院）工作并实施过血管穿刺？ [单选题]

☐ 是

☐ 否（自动跳至第 17 题）

16. 若有基层医院工作经历，请描述主要挑战： [多选题]

☐ 无超声设备/不易获取

☐ 未熟练掌握超声引导下穿刺

☐ 未熟练掌握体表标志法穿刺

☐ 患者血管条件较差

☐ 缺乏上级医师及时指导

☐ 其他（请填写） _____

【自信心评估（1=非常不自信，5=非常自信）】

17. 在使用盲穿法进行以下操作时，您的自信心如何？ [矩阵单选题]

	1	2	3	4	5
颈内静脉穿刺	☐	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐	☐

18. 在使用盲穿法应对急诊手术进行以下操作时，您的自信心如何？ [矩阵单选题]

	1	2	3	4	5
颈内静脉穿刺	☐	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐	☐

19. 在肥胖患者中使用盲穿法进行以下操作时，您的自信心如何？ [矩阵单选题]

	1	2	3	4	5
颈内静脉穿刺	☐	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐	☐

20. 在使用超声引导进行以下操作时，您的自信心如何？ [矩阵单选题]

	1	2	3	4	5
颈内静脉穿刺	☐	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐	☐

【尝试次数】

21. 多数情况下，以下操作使用盲穿法时，成功完成穿刺所需的尝试次数： [矩阵单选题]

	1 次	2 次	3 次	≥4 次
颈内静脉穿刺	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐

22. 多数情况下，以下操作使用超声引导时，成功完成穿刺所需的尝试次数： [矩阵单选题]

	1 次	2 次	3 次	≥4 次
颈内静脉穿刺	☐	☐	☐	☐

桡动脉穿刺 ☐ ☐ ☐ ☐

【请求协助频率】

23. 以下操作使用盲穿法穿刺时，请求上级医师协助的频率： [矩阵单选题]

	经常	有时	很少	从未
颈内静脉穿刺	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐

24. 以下操作使用超声引导穿刺时，请求上级医师协助的频率：
[矩阵单选题]

	经常	有时	很少	从未
颈内静脉穿刺	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐

25. 您认为盲穿法在当代麻醉实践中是否仍有必要？ [单选题]

☐ 非常必要

☐ 必要

☐ 一般

☐ 不必要

☐ 完全没必要

26. 您是否担心在无超声设备的医院工作时无法胜任血管穿刺？

[单选题]

☐ 非常担心

☐ 担心

☐ 一般

☐ 不担心

☐ 完全不用担心

27. 您是否支持在住培期间强化盲穿训练？ [单选题]

☐ 非常支持

☐ 支持

☐ 中立

☐ 反对

☐ 非常反对

导师版问卷

28. 您所在的住培基地名称： [填空题]

29. 您所在的省份/直辖市： [填空题]

30. 您的职称： [单选题]

☐ 主任医师

☐ 副主任医师

☐ 主治医师

☐ 住院医师

31. 您的性别： [单选题]

☐ 男

☐ 女

32. 您的年龄： [填空题]

33. 您的带教年限： [单选题]

☐ ≤5 年

☐ 6-10 年

☐ 11-15 年

☐ ≥16 年

34. 您所在医院的手术间与超声设备配置情况是： [单选题]

☐ 专机专用（1:1）

☐ 2-3 间配一台

☐ 4-5 间配一台

☐ 6-7 间配一台

☐ 8 间以上配一台

☐ 无超声设备

【说明】以下血管穿刺特指颈内静脉或桡动脉穿刺置管术。

35. 在您关于血管穿刺操作的教学活动中优先使用哪种方式？ [矩阵单选题]

盲穿法

超声引导

颈内静脉穿刺

☐

☐

桡动脉穿刺

☐

☐

36. 您是否会在教学中强调盲穿法的穿刺能力更为重要： [单选题]

☐ 总是

☐ 经常

☐ 有时

☐ 很少

☐ 从不

37. 是否有专为盲穿法血管穿刺设置的培训课程？ [矩阵单选题]

是，有独立培训课程 否，仅有临床带教

颈内静脉穿刺 ☐ ☐

桡动脉穿刺 ☐ ☐

38. 是否有专为超声引导下血管穿刺设置的培训课程？ [矩阵单选题]

是，有独立培训课程 否，仅有临床带教

颈内静脉穿刺 ☐ ☐

桡动脉穿刺

O0

39. 您认为是否有必要建立盲穿法专项培训课程： [单选题]

○ 非常有必要

○ 比较有必要

○ 一般

○ 不太有必要

○ 完全没必要

【说明】：40-42 题 请根据学员的实际能力进行评分（1=非常差，5=非常好）

40. 学员在使用盲穿法进行血管穿刺的能力评分 (1=非常差, 5=非常好): [矩阵单选题]

1 分

2 分

3 分

4 分

5 分

颈内静脉穿刺

OOOOO

桡动脉穿刺

OOOOO

41. 学员在使用超声引导进行血管穿刺的能力评分 (1=非常差, 5=非常好): [矩阵单选题]

	1 分	2 分	3 分	4 分	5 分
颈内静脉穿刺	☐	☐	☐	☐	☐
桡动脉穿刺	☐	☐	☐	☐	☐

42. 您认为，近年来结业的学员其盲穿法技能与 5 年前的学员相比如何？ [单选题]

- ☐明显下降
- ☐有所下降
- ☐差不多
- ☐有所提升
- ☐明显提升

43. 您是否在血管穿刺操作时对超声产生依赖心理？ [矩阵单选题]

	是，有依赖	否，无依赖
颈内静脉穿刺	☐	☐
桡动脉穿刺	☐	☐

44. 您认为，在当今时代，熟练掌握盲穿法血管穿刺对于麻醉医生

是否必要？ [单选题]

- ☐ 非常必要
- ☐ 必要
- ☐ 可有可无
- ☐ 不必要
- ☐ 完全没必要

45. 您是否担心您所培训的学员，未来在缺乏超声设备的医院工作时会遇到困难？ [单选题]

- ☐ 非常担心
- ☐ 比较担心
- ☐ 一般
- ☐ 不太担心
- ☐ 完全不担心

46. 是否对学员的超声引导下血管穿刺技能进行考核？ [矩阵单选题]

是，有考核 否，无考核

颈内静脉穿刺 ☐ ☐

桡动脉穿刺 ☐ ☐

47. 您是否支持在住培结业考核中，增设“超声引导下完成血管穿刺”的考核项目？ [单选题]

☐ 非常支持

☐ 支持

☐ 中立

☐ 反对

☐ 强烈反对

48. 您认为当前住培体系在"培养学员适应不同资源环境的能力"方面存在哪些不足？（可多选） [多选题]

☐ 过于依赖高端设备教学

☐ 课程设置不够系统

☐ 缺乏针对性的模拟训练

☐ 导师自身观念重超声轻体表

☐ 培训时间不足

☐ 教学资源分配不均

☐ 其他 _____