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Research Article

Keywords: informed consent, China, anesthesiology training, surgical education, clinical teaching procedures

Posted Date: October 12th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10697894/v1>

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Additional Declarations: No competing interests reported.

Original Research

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Is Obtaining Specific Consent for Educational Skill Training on Patients Necessary? An Analysis of Arguments For and Against Among Chinese Medical Students

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Abstract:

Purpose: In clinical education, medical students and residents routinely perform procedural skills on patients, yet the ethical and practical dimensions of informed consent for such teaching activities remain controversial. While patient autonomy and the right to be informed are fundamental, the educational necessity of hands-on training must also be weighed. This study aimed to investigate attitudes toward informed consent for clinical teaching procedures in Chinese teaching hospitals, and to compare their perspectives on consent formats, patient refusal reasons, and perceived impacts of training restrictions.

Patients and methods: We conducted a cross-sectional survey across three teaching hospitals and one medical college in Anhui Province, China. The survey assessed preferences for consent types (separate signed consent, risk-stratified approach, or implied consent), reasons for patient refusal, perceived educational threat from teaching restrictions, and concern over medical disputes.

Results: A total of 559 trainees participated. Surgical residents (66.7%) and medical students (64.4%) were significantly more likely than anesthesiology residents (34.6%) to demand separate signed consent for teaching procedures ($p=0.003$). Anesthesiology residents preferred a risk-stratified approach (47.8% vs. 25.0%, $p=0.038$). Medical students prioritized patient rights more (59.8% vs. 43.1%, $p<0.001$) and accepted implied consent less (55.1% vs. 70.0%, $p=0.001$) than residents. The most common reasons for patient refusal were distrust of trainee competence (69-83%-) and procedural complication concerns (71-82%-). Over 90% of anesthesia residents and 83% of surgical residents believed that restricting teaching would have a severe or major negative impact on their education, compared to 68.9% of medical students ($p<0.001$). Medical students were more concerned about medical dispute risk (68.4% vs. 53.8%, $p=0.001$).

Conclusion: Surgical residents and medical students favor separate explicit consent for teaching procedures, whereas anesthesia residents prefer a risk-stratified approach. The high perceived educational threat from restrictions and prevalent patient refusal driven by distrust highlight the urgent need for tiered consent policies and enhanced ethics training in Chinese teaching hospitals.

Keywords: informed consent; China; anesthesiology training; surgical education; clinical teaching procedures

Introduction

The issue of trainees performing clinical procedures—including physical examinations, non-invasive tests, and invasive interventions that demand explicit consent—on patients has emerged as a highly debated topic in medical education ethics. In China, hospitals are formally classified as teaching or non-teaching institutions, and the practice of presuming **implied patient consent** for trainee-performed care in teaching hospitals remains poorly defined and understudied. Internationally, numerous jurisdictions mandate specific informed consent for trainee involvement in privacy-related or invasive procedures; yet, real-world clinical practice frequently diverges from these ethical and regulatory standards. This discrepancy has drawn intensified scrutiny in recent years, particularly in China amid heightened tensions in the doctor-patient relationship. The study emphasizes that without a solid ethical foundation, teaching activities may infringe upon patients' rights; therefore, it is imperative to clarify that informed consent is not merely a legal requirement but also the cornerstone of physician-patient trust^{[1][2]}.

Core arguments in favor of requiring **additional, specific patient consent** for trainee-performed procedures center on fundamental ethical principles: patient rights, dignity, autonomy, equity, trust, transparency, and trauma-informed care^[3]. Conversely, the educational crisis caused by patient refusal of trainee involvement in clinical procedures has been widely documented across healthcare systems.

To date, trainee perspectives on informed consent for teaching-related procedures remain poorly characterized, especially in mainland China. Studies of U.S. medical students have demonstrated strong support for mandatory specific consent for trainee-performed sensitive examinations under anesthesia. However, equivalent empirical research exploring Chinese trainees' attitudes toward the ethical requirement of explicit consent for teaching-related clinical procedures is lacking. While professional ethics training clearly requires trainees to obtain verbal or written informed consent and introduce themselves before any clinical intervention, it does not explicitly mandate disclosure that **“the following procedure will be performed by a trainee under direct faculty supervision”**.

To address this critical knowledge gap, we administered a cross-sectional survey to clinical trainees from three teaching hospitals and one medical school in Anhui Province, China. Our study aimed to characterize their attitudes, experiences, and current practices regarding obtaining patient informed consent for trainee-performed clinical procedures during graduate medical education.

Material and methods

Questionnaire

This study was conducted within a standard educational and training setting and was classified as a project exempt from ethical review. The First Affiliated Hospital of the University of Science and Technology of China (USTC) Ethics Committee approved this study (Application Number 2026-KY-324).

This study had been performed in accordance with the principles stated in the Declaration of Helsinki. Data collection was conducted using an online questionnaire hosted on Wenjuanxing, with the instrument being composed in Chinese. The survey questionnaire was developed by the research team specifically for this study and has not been previously published elsewhere. The questionnaire was administered anonymously, and participants were informed from the outset that no personal privacy information would be collected. The questionnaire is not mandatory to complete; completion automatically indicates consent to participate in the study. Therefore, as there is no dedicated informed consent form for this questionnaire, participants may simply decline completion if they do not wish to participate. Prior to the formal distribution of the questionnaire, the research team conducted a pilot study with a small cohort of students. This preliminary testing (oral communication) was designed to identify potential issues, ensure the questionnaire's accessibility, and enhance the overall validity of the research.

Distribution

The study's eligible participants were categorized into four distinct groups, each receiving questionnaires specifically designed to align with their professional roles. These groups comprised anesthesiology residents engaged in standardized training at two teaching hospitals, surgical residents undergoing standardized training at an additional teaching hospital, and medical students who had recently completed their undergraduate clinical rotations at a medical college. Data collection was conducted from May 2025 to June 2026, with medical student data collected across two academic years (2025 and 2026 cohorts). The research team reached out to the academic administrators of the three major teaching hospitals and the local medical college mentioned. All four institutions responded affirmatively

and participated in the survey. The questionnaires were distributed to the targeted student groups through these academic administrators, rather than via social media channels. One institution's academic administrator offered a monetary incentive, amounting to 574.78 RMB, to encourage questionnaire completion. Data analysis included responses from all participants who answered at least one question.

Analysis and Statistics

This was a cross-sectional questionnaire-based study designed to investigate the perceptions and practices of residents regarding informed consent for clinical skill teaching procedures in teaching hospitals.

1. Data Collection and Processing

A total of 559 valid questionnaires were collected, from surgical residents, anesthesiology residents, and medical students. All questionnaires were reviewed for completeness; only fully completed forms with valid responses to core items were included in the final analysis, with no invalid or missing datasets excluded.

2. Descriptive Statistics

All categorical variables were summarized using frequency counts and percentages (n, %) due to the nominal and ordinal nature of questionnaire responses. Demographic characteristics (gender, age, training type, postgraduate year), clinical competency, consent preferences, institutional protocols, patient refusal patterns, risk/benefit perceptions, and attitudinal responses were all presented as proportions to characterize distribution trends across surgical and anesthesiology cohorts.

3. Comparative Statistical Analysis

Between-group comparisons (surgical residents vs. anesthesiology residents; anesthesiology residents from different institutions) for categorical variables were performed using the Pearson χ^2 test or Fisher's exact test (when expected cell frequencies < 5) to evaluate differences in consent attitudes, protocol awareness, risk perception, and preference for balancing patient rights and educational needs. A two-sided p-value < 0.05 was considered statistically significant.

4. Software and Tools

Data entry and cleaning were performed using Microsoft Excel.

The Shapiro–Wilk test was employed to evaluate the normality of the data. Normally distributed data are expressed as the mean (standard deviation), whereas non-normally distributed data are reported as the median (interquartile range). Categorical data are presented as frequencies (percentages). All figures were generated with the R software (<http://www.R-project.org>; Version 4.2.1). The criteria of statistical significance were set as a p-value < 0.05 or adjusted p-value < 0.05. The parametric test of Student's t-test and the non-parametric Mann–Whitney U-test were performed to compare the differences between the two groups. The adjusted p-value was calculated by the Benjamini-Hochberg correction and the Chi-square test was used to analyze the categorical variables.

RESULTS

Participant Demographics

A total of 559 unique participants completed at least one question across five independent cross-sectional surveys. These included:

- Surgical residents (Surg, n=24)
- Anesthesiology residents – Survey A (AnesA, n=72)
- Anesthesiology residents – Survey B (AnesB, n=64)
- Medical students/interns – Survey C (MedC, n=376, collected in 2026)
- Medical students/interns – Survey D (MedD, n=23, collected in 2025)

The two anesthesiology cohorts differed in training identity and age distribution, but not in the main consent-attitude outcomes; therefore, they were pooled for prespecified specialty-level comparisons. The two medical student samples are not pooled; MedC (n=376) is used as the primary comparison group for residents, while MedD (n=23) is described separately due to its small size and potential temporal differences.

Demographic characteristics for each original cohort are presented in Table 1.

Table 1. Baseline Characteristics of the Four Independent Cohorts

	Surg	AnesA	AnesB	MedC	MedD
Characteristic	(n=24)	(n=72)	(n=64)	(n=376)	(n=23)

Gender

	Surg	AnesA	AnesB	MedC	MedD
Characteristic	(n=24)	(n=72)	(n=64)	(n=376)	(n=23)
Male	20 (83.3%)	30 (41.7%)	26 (40.6%)	211 (56.1%)	12 (52.2%)
Female	4 (16.7%)	42 (58.3%)	38 (59.4%)	165 (43.9%)	11 (47.8%)
Age					
<25 years	8 (33.3%)	22 (30.6%)	35 (54.7%)	371 (98.7%)	23 (100%)
26–30 years	16 (66.7%)	48 (66.7%)	27 (42.2%)	5 (1.3%)	0
31–35 years	0	2 (2.8%)	2 (3.1%)	0	0
Training year					
First year (PGY-1)	3 (12.5%)	31 (43.1%)	31 (48.4%)	N/A	N/A
Second year (PGY-2)	9 (37.5%)	24 (33.3%)	18 (28.1%)	N/A	N/A
Third year (PGY-3)	12 (50.0%)	17 (23.6%)	15 (23.4%)	N/A	N/A
Can work independently	17 (70.8%)	50 (69.4%)	40 (62.5%)	92 (24.5%)	5 (21.74%)

Current Consent Practices and Trainee Perspectives

Current Institutional consent processes. As shown in Table 2, a majority of Surg (62.5%) and MedC (66.5%) reported that their hospital had a **separate written consent form** for teaching procedures. In contrast, only 37.5% (AnesA) and 50.0% (AnesB) of anesthesiology residents reported this. Notably, 19.4% (AnesA) and 17.2% (AnesB) indicated they were “unclear” about their hospital’s consent process, compared to 4.2% (Surg) and 12.8% (MedC).

Table 2. Reported Institutional Consent Processes for Clinical Teaching

Consent Process	Surg (n=24)	AnesA (n=72)	AnesB (n=64)	MedC (n=376)	MedD (n=23)
Separate written consent form	15 (62.5%)	27 (37.5%)	32 (50.0%)	250 (66.5%)	17 (73.9%)
Included in general procedure consent	6 (25.0%)	19 (26.4%)	12 (18.8%)	42 (11.2%)	3 (13.0%)
Oral notification only, no written record	0	5 (6.9%)	3 (4.7%)	21 (5.6%)	0
No specific process (default consent assumed)	2 (8.3%)	7 (9.7%)	6 (9.4%)	14 (3.7%)	0
Unclear	1 (4.2%)	14 (19.4%)	11 (17.2%)	48 (12.8%)	3 (13.0%)

Need for separate, explicit consent. Attitudes varied significantly (Table 3). A strong majority of Surg (66.7%) and MedC (64.4%) believed teaching procedures **must have separate signed consent**. Anesthesiology residents were less likely to endorse this (AnesA: 26.4%; AnesB: 43.8%) and more likely to favor “consent documented in general consent” or “depends on procedure risk level.”

Table 3. Trainee Views on Whether Teaching Procedures Require Separate Explicit

Consent

Attitude	Surg (n=24)	AnesA (n=72)	AnesB (n=64)	MedC (n=376)	MedD (n=23)
Must have separate signed consent	16 (66.7%)	19 (26.4%)	28 (43.8%)	242 (64.4%)	15 (65.2%)
Should be explicitly stated in general consent	4 (16.7%)	23 (31.9%)	13 (20.3%)	60 (16.0%)	7 (30.4%)
Oral notification is sufficient	0	2 (2.8%)	3 (4.7%)	16 (4.3%)	0
No special notification (default for teaching hospital)	2 (8.3%)	16 (22.2%)	7 (10.9%)	10 (2.7%)	0
Depends on procedure risk level	2 (8.3%)	12 (16.7%)	13 (20.3%)	48 (12.8%)	1 (4.3%)

Procedures requiring specific consent. High-risk invasive procedures (thoracentesis, lumbar puncture, paracentesis, bone marrow aspiration) were endorsed for signed consent

by >85% of respondents across all groups where these items were asked. Differences emerged for intermediate-risk procedures (Table 4). For **central venous catheterization**, anesthesiology residents endorsed consent at higher rates (AnesA: 87.5%; AnesB: 71.9%) than Surg (66.7%) or MedC (58.2%). For **urinary catheterization** Surg (58.3%) were more likely to require consent than MedC (42.8%); this item was not included in the anesthesiology questionnaires.

Table 4. Proportion Endorsing “Procedure Requires Signed Consent” – Selected

Examples

Procedure	Surg (n=24)	AnesA (n=72)	AnesB (n=64)	MedC (n=376)	MedD (n=23)
Thoracentesis	24 (100%)	–	–	338 (89.9%)	20 (87.0%)
Lumbar puncture	23 (95.8%)	–	–	326 (86.7%)	21 (91.3%)
Paracentesis	24 (100%)	–	–	318 (84.6%)	20 (87.0%)
Bone marrow aspiration	24 (100%)	–	–	323 (85.9%)	20 (87.0%)
Central venous catheterization	16 (66.7%)	63 (87.5%)	46 (71.9%)	219 (58.2%)	15 (65.2%)

Procedure	Surg (n=24)	AnesA (n=72)	AnesB (n=64)	MedC (n=376)	MedD (n=23)
Tracheal intubation	19 (79.2%)	41 (56.9%)	35 (54.7%)	244 (64.9%)	18 (78.3%)
Suture/incision/knot-tying	14 (58.3%)	–	–	147 (39.1%)	10 (43.5%)

– Not asked in that survey.

Patient Refusal of Teaching Activities

Frequency of refusal. As shown in Table 5, the combined rate of “occasional or frequent” refusal for student-performed procedures was 33.3% (Surg), 37.5% (AnesA), 37.5% (AnesB), and 28.7% (MedC). MedD reported a lower rate (13.0%), but the sample is small.

Table 5. Trainee-Reported Frequency of Patient Refusal (Student-Performed Procedures)

Frequency	Surg (n=24)	AnesA (n=72)	AnesB (n=64)	MedC (n=376)	MedD (n=23)
Frequent (>30% of cases)	1 (4.2%)	7 (9.7%)	6 (9.4%)	36 (9.6%)	0
Occasional (10–30%)	7 (29.2%)	20 (27.8%)	18 (28.1%)	72 (19.1%)	3 (13.0%)

	Surg	AnesA	AnesB	MedC	MedD
Frequency	(n=24)	(n=72)	(n=64)	(n=376)	(n=23)
Rare (<10%)	14 (58.3%)	30 (41.7%)	29 (45.3%)	160 (42.6%)	5 (21.7%)
Never	2 (8.3%)	10 (13.9%)	4 (6.3%)	86 (22.9%)	11 (47.8%)
Unclear	0	5 (6.9%)	7 (10.9%)	22 (5.9%)	4 (17.4%)

Perceived reasons for refusal. The three most commonly cited reasons across groups were: **distrust of trainee competence** (Surg: 83.3%; AnesA: 83.3%; AnesB: 75.0%; MedC: 69.4%), **concern about procedural complications** (Surg: 75.0%; AnesA: 81.9%; AnesB: 78.1%; MedC: 71.3%), and **privacy concerns** (Surg: 79.2%; AnesA: 36.1%; AnesB: 46.9%; MedC: 61.7%).

Perceived Risks, Benefits, and Educational Impact

Risk perception. Most trainees rated the additional risk of teaching procedures as low to moderate. In the combined resident group (Surg+Anes), 41.2% chose “moderate (similar to routine procedure risk)” and 29.4% “low (almost no additional risk).” Among MedC, 42.3% chose “low” and 35.9% “moderate.” **Procedural complications** were the most feared risk (Surg: 79.2%; AnesA: 87.5%; AnesB: 76.6%; MedC: 83.0%). **Medical dispute risk** was significantly more concerning for MedC (68.4%) than for residents (53.8%, $p=0.001$).

Perceived benefits. The most widely recognized benefit was “**promoting medical education development (future patient benefit)**” (Surg: 83.3%; AnesA: 81.9%; AnesB:

84.4%; MedC: 75.3%). **“Receiving more detailed medical attention”** was also endorsed by a majority (Surg: 79.2%; AnesA: 62.5%; AnesB: 67.2%; MedC: 71.3%).

Impact of restricting trainee-performed procedures. A large majority of residents believed that restricting such procedures would have a **severe or major negative impact** (Surg: 83.3%; AnesA: 91.7%; AnesB: 92.2%). MedC was less likely to rate the impact as severe (29.8%) and more likely to believe simulation could substitute (“general impact, can be replaced by simulation”: 24.5% vs. 8.1% of residents, $p<0.001$).

Balancing Patient Rights and Training Needs

As shown in Table 6, Surg (62.5%) and MedC (59.8%) predominantly favored **“prioritize patient rights (strict informed consent).”** Anesthesiology residents showed a near-equal preference for “prioritize patient rights” (AnesA: 38.9%; AnesB: 40.6%) and **“risk-stratified management”** (AnesA: 47.2%; AnesB: 48.4%).

Table 6. Trainee Views on Balancing Patient Rights and Teaching Needs

Approach	Surg (n=24)	AnesA (n=72)	AnesB (n=64)	MedC (n=376)	MedD (n=23)
Prioritize patient rights (strict consent)	15 (62.5%)	28 (38.9%)	26 (40.6%)	225 (59.8%)	11 (47.8%)
Prioritize teaching needs (loosen consent)	3 (12.5%)	10 (13.9%)	7 (10.9%)	44 (11.7%)	5 (21.7%)
Risk-stratified management	6	34	31	107	7 (30.4%)

	Surg	AnesA	AnesB	MedC	MedD
Approach	(n=24)	(n=72)	(n=64)	(n=376)	(n=23)
	(25.0%)	(47.2%)	(48.4%)	(28.5%)	

View on implied consent. The statement “Visiting a teaching hospital implies consent to teaching procedures” received only partial support (Table 7). The most common response across all groups was “**partially agree, but basic disclosure is still needed**” (Surg: 66.7%; AnesA: 58.3%; AnesB: 46.9%; MedC: 37.0%). Complete agreement (“fully agree”) was low (Surg: 16.7%; AnesA: 11.1%; AnesB: 18.8%; MedC: 18.1%).

Table 7. Agreement with Implied Consent

	Surg	AnesA	AnesB	MedC	MedD
Response	(n=24)	(n=72)	(n=64)	(n=376)	(n=23)
Fully agree (patients should expect teaching environment)	4 (16.7%)	8 (11.1%)	12 (18.8%)	68 (18.1%)	4 (17.4%)
Partially agree (but basic disclosure still needed)	16 (66.7%)	42 (58.3%)	30 (46.9%)	139 (37.0%)	14 (60.9%)
Neutral	1 (4.2%)	18 (25.0%)	17 (26.6%)	108 (28.7%)	3 (13.0%)
Disagree (explicit consent required)	2 (8.3%)	4 (5.6%)	4 (6.3%)	52 (13.8%)	2 (8.7%)

	Surg	AnesA	AnesB	MedC	MedD
Response	(n=24)	(n=72)	(n=64)	(n=376)	(n=23)
Completely oppose (must have separate consent)	1 (4.2%)	0	1 (1.6%)	9 (2.4%)	0

Comparison Between Surgical and Anesthesia Residents (Combined)

When comparing surgical residents (n=24) to all anesthesia residents (AnesA+AnesB, n=136), the following differences were statistically significant:

Table 8. Comparison Between Surgical and Anesthesia Residents

Comparison	Surg (n=24)	Anes (n=136)	χ^2 (df=1)	p-value
Must have separate signed consent	16 (66.7%)	47 (34.6%)	8.81	0.003
Prioritize patient rights	15 (62.5%)	54 (39.7%)	4.32	0.038
Risk-stratified management	6 (25.0%)	65 (47.8%)	4.29	0.038

No significant differences were found for: “implied consent agreement” (Surg 83.3% vs. Anes 67.6%, $\chi^2=2.39$, $p=0.12$), “ever encountered refusal” (Surg 33.3% vs. Anes 37.5%, $\chi^2=0.15$, $p=0.70$), or “medical dispute as top concern” (Surg 58.3% vs. Anes 52.9%, $\chi^2=0.25$, $p=0.62$).

Comparison Between All Residents (n=160) and Medical Students (MedC, n=376)

All residents (Surg+Anes, n=160) were compared to the primary medical student cohort (MedC, n=376). Results are summarized in Table 9.

Table 9. Comparison Between All Residents and Medical Students

Variable	Residents (n=160)	MedC (n=376)	χ^2 (df=1)	p-value
Must have separate signed consent	63 (39.4%)	242 (64.4%)	28.58	<0.001
Prioritize patient rights	69 (43.1%)	225 (59.8%)	12.66	<0.001
Risk-stratified management	71 (44.4%)	107 (28.5%)	12.82	<0.001
Agree with implied consent (fully/partially)	112 (70.0%)	207 (55.1%)	10.41	0.001
Ever encountered refusal (occasional/frequent)	59 (36.9%)	108 (28.7%)	3.48	0.062
Believe restriction would cause "severe" impact	94 (58.8%)	112 (29.8%)	39.80	<0.001
Top concern: medical dispute risk	86 (53.8%)	257 (68.4%)	10.38	0.001

*Note: The difference in "ever encountered refusal" did not reach conventional statistical significance (p=0.062). *For the small 2026 medical student cohort (MedD, n=23): 65.2%

(15/23) favored separate signed consent (similar to MedC), and 47.8% (11/23) favored prioritizing patient rights. Due to sample size, these data were not included in comparative statistical analyses.

Discussion

This study represents the first empirical investigation of Chinese surgical and anesthesiology trainees' attitudes, experiences, and practices regarding informed consent for clinical teaching procedures. Across 559 participants from multiple training sites, we found significant differences across specialties and training stages. Surgical residents and medical students held more patient-rights-oriented views, favoring separate written consent for teaching procedures, whereas anesthesiology residents were more likely to endorse a risk-stratified approach. These findings highlight a critical tension between ethical principles of patient autonomy ^[4]and the educational needs of trainees—a tension increasingly recognized in other healthcare systems but understudied in China^{[5][6]}.

Specialty Differences in Consent Practices: The Anesthesiology Exception

Our data revealed that anesthesiology residents were significantly less likely than surgical residents to demand separate signed consent for teaching procedures (34.6% vs. 66.7%, $p=0.003$) and more likely to favor risk-stratified management (47.8% vs. 25.0%, $p=0.038$). This finding requires careful interpretation beyond a simple characterization of anesthesiologists as “less rights-protective.”

A key explanation lies in China's current consent documentation system. In Chinese clinical practice, anesthetic procedures are covered by a single comprehensive "Anesthesia Informed Consent Form," which typically includes general risks and a list of potential procedures (e.g., tracheal intubation, central venous catheterization, arterial puncture, neuraxial blocks) but does not require separate, procedure-specific signatures for each individual maneuver. Therefore, when anesthesiology residents report that teaching procedures do not require "separate signed consent," they may be accurately describing the existing institutional framework rather than expressing disregard for patient autonomy. In contrast, surgical residents and medical students—who are more accustomed to obtaining consent for discrete bedside procedures (e.g., thoracentesis, lumbar puncture) using separate procedure-specific forms—may perceive a procedural "gap" in anesthetic teaching. This discrepancy suggests that the observed specialty difference is partly an artifact of divergent documentation systems, not necessarily a reflection of differing ethical commitments. This issue faces the same dilemma as that encountered in the "Broad consent"^[7] versus "tiered, dynamic"^{[8][9]}, or meta-consent"^[10] for biological samples.

It is worth discussing whether further clarification of tiered teaching consent or dynamic teaching consent is necessary in anesthesiology education^[11]. Whether repeated tiers of consent increase patients' cognitive load and consequently lead to higher rates of "refusal" remains unclear. Moreover, during relatively coherent clinical practice in anesthesia education, interrupting the process to obtain informed consent appears inappropriate. Whether there are more flexible and autonomous approaches to obtaining informed consent for secondary research warrants further exploration^[12]. For this reason, we propose modifications to the

current broad consent model, in order to ensure that it provides protection of autonomy and participant values through strong ethical review and continuous communication.

The unique context of unconscious patients adds further complexity to the consent

discussion. Friesen and colleagues ^[13] have argued that patients have the right to know “who exactly will be in contact with their body during the operation” and “what will be happening to their bodies during surgery, particularly when they are in a vulnerable position under anesthesia.” While these principles are ethically sound, their implementation in anesthesiology faces practical challenges that our respondents may have implicitly recognized.

Most anesthetic procedures are performed after the patient has lost consciousness; obtaining separate, real-time consent for each teaching maneuver is logistically impossible. During the work experience in Canada^[14], the majority of respondents reported being uncomfortable or unsure if they were comfortable with how consent for educational sensitive EUAs was practised during their training, and some respondents struggled to express their discomfort given the power dynamics at play.

The alternative—preoperative disclosure that “a resident may perform intubation, arterial line placement, and central venous access under supervision”—is feasible but may overwhelm^[15] patients with information and potentially increase refusal rates for essential procedures.

Anesthesiology residents’ preference for a bundled or risk-stratified approach may represent a pragmatic compromise: accept that a single anesthesia consent form covers all indicated procedures (including those performed by trainees), while ensuring that high-risk or elective teaching maneuvers receive explicit discussion.

Discussions regarding gender and privacy tend to be more frequent; fortunately, anesthesiologists' procedures rarely involve these aspects, focusing primarily on procedural risks. This tension between ethical ideals and clinical reality is not unique to China^{[16][17][18]}; similar debates have occurred in the context of pelvic examinations under anesthesia^{[19][20][21][22]}, where professional guidelines now mandate specific consent despite concerns about feasibility^[23].

On the other hand, Particularly in specialized fields such as pediatrics^[24], given that pediatric patients may not fully comprehend or possess the capacity for consent, balancing parental authorization with respect for the child's right to refuse poses significant challenges in research.

The Ideal of Patient Autonomy vs. Clinical Reality

The statement that “as part of the autonomy they have over their care, patients should know who is involved in their treatment, what exactly will be done, and what their role is” is conceptually sound but practically difficult to achieve in teaching hospitals. It is commonly emphasized that patients cannot truly be “fully informed” because a discussion of all possible facts, scenarios, and complications would, in and of itself, present a biased view of the planned procedure and affect the consent process. We emphasize a patient-centered approach^[25]; however, obtaining patient consent for procedures aimed at educational purposes is particularly challenging when cultural or medical literacy is limited.

Our data reveal that trainees themselves recognize this difficulty. While 64.4% of medical students endorsed “must have separate signed consent,” only 55.1% agreed (even partially)

with implied consent, and 13.8% explicitly disagreed. This suggests that students want more transparency but are uncertain how to achieve it without disrupting clinical workflow.

The practical barriers are substantial. First, the composition of the teaching team varies daily; it is impossible to predict weeks in advance which resident will perform which procedure.

Second, many teaching procedures are brief, low-risk, and occur in rapid succession—obtaining written consent for each would paralyze clinical care. Third, as our data show, patients already refuse trainee involvement at notable rates (28.7-36.9% occasional/frequent refusal). Explicit, separate consent for every teaching maneuver might increase refusal rates further, potentially compromising resident education and, by extension, future patient safety. This is not a trivial concern: 91.9% of anesthesia residents and 83.3% of surgical residents in our study believed that restricting trainee-performed procedures would have a severe or major negative impact on their education.

However, the difficulty of implementation does not justify inaction. The most feasible path forward, suggested by the risk-stratified approach favored by anesthesiology residents, is to tier consent requirements: (1) low-risk, non-invasive teaching activities (e.g., observing, retracting, suturing skin) could be covered by general notification in the hospital's admission materials; (2) moderate-risk procedures (e.g. arterial puncture) should be disclosed during the general consent conversation, with an opportunity to decline; and (3) high-risk or privacy-sensitive procedures (e.g., central venous catheterization, neuraxial blocks) should require explicit, separate written consent. This graduated approach respects patient autonomy while preserving educational opportunities. However, in actual clinical teaching practice, numerous challenges still persist.

The process of obtaining consent and its validation remain key research topics. Scholars have examined the specific workflow from "seeking consent" to "obtaining valid consent," emphasizing the necessity to ensure patients fully comprehend the nature of the educational intervention rather than merely treating it as part of the diagnostic or therapeutic procedure. Some studies have also addressed how to handle patients' refusal to participate in medical education, emphasizing that respecting such refusal is a crucial aspect of maintaining physician-patient relationships. Consequently, integrating informed consent into the medical education system has become a key issue. Relevant research has explored methods for teaching medical students the principles of informed consent, aiming to enhance their skills in communicating with patients, explaining medical conditions, and obtaining consent ^[26].

Comparison with International Findings

Our results align broadly with studies from North America. Zuckelkowski and colleagues reported that 75% of U.S. medical students believed specific consent should be sought for educational pelvic exams under anesthesia. Friesen^[13] found that 72% of Canadian medical students believed specific consent is morally required, while 20% were unsure and 8% disagreed. The proportion of Chinese medical students supporting separate consent in our study (64.4%) is slightly lower but comparable, considering that our question referred to "teaching procedures" broadly rather than exclusively to sensitive exams under anesthesia. The lower support among Chinese students may reflect less exposure to explicit ethics discussions about consent in the curriculum.

One notable difference is the higher proportion of Chinese trainees who endorsed “no special notification (default for teaching hospital)” (surgical: 8.3%; anesthesia: 16.9%; medical students: 2.7%) compared to Canadian medical students (8% “no”). This suggests that the “implied consent” assumption may be more prevalent in Chinese teaching hospitals, possibly due to less explicit regulatory guidance and fewer high-profile public controversies about non-consensual teaching procedures.

Patient Refusal: Drivers and Discrepancies

Consistent with prior literature, **distrust of trainee competence** (69-83% across groups) and **concern about procedural complications** (71-82%) were the most frequently cited reasons for patient refusal. These findings echo those of Friesen^[13], where patient anxiety about student skill as a barrier. Actually, not only patients but also instructors share concerns. Before entering the high-risk setting of the operating room, instructors must assess their students' capabilities^[27].

Notably, anesthesia residents reported slightly higher rates of patient refusal (37.5% occasional/frequent) than medical students (28.7%), though this difference was not statistically significant ($p=0.062$). This trend may reflect that patients are more willing to allow medical students to observe than to allow residents—who are more advanced but still learners—to perform invasive procedures on them.

Medical students were significantly more concerned about **medical dispute risk** (68.4%) than residents (53.8%, $p=0.001$). This is likely a function of inexperience. In the current Chinese healthcare environment, where doctor-patient tensions are high and litigation is increasing,

medical students may have internalized a fear of legal consequences before they have developed the clinical judgment to manage risk. Prior studies in China have shown that fear of litigation significantly influences physicians' consent practices; our data suggest this fear is already present at the student level and may shape their attitudes toward consent independently of clinical exposure.

The Educational Threat of Restricting Teaching

A striking finding was that **91.9% of anesthesia residents** and **83.3% of surgical residents** believed that restricting trainee-performed procedures would have a severe or major negative impact on their education. This contrasts with medical students, of whom only 68.9% shared this concern, and 24.5% believed simulation could adequately substitute. This difference likely reflects residents' direct experience with the limitations of simulation. While simulators can teach basic technical skills, they cannot replicate patient-specific anatomy, tissue variability, unexpected complications, or the time pressure and stress of real procedures^[28]. As one senior resident quoted in the literature noted, "someone who is skilled in procedures can save lives." Residents recognize that restricting their clinical opportunities could produce a generation of under-prepared physicians.

This finding has important policy implications. If teaching hospitals respond to patient rights concerns by sharply limiting trainee involvement without providing alternative educational pathways, they risk compromising the competence of future physicians. A balanced approach—preserving supervised clinical training for essential procedures while expanding simulation for initial skill acquisition—is necessary^[29].

At the author's hospital, simulation-based training has become a standard component of the curriculum for standardized resident physicians, aiming to address the limitations of clinical teaching. Additionally, this questionnaire and paper seek to encourage educational authorities to further increase investment in simulation-based training, thereby safeguarding the interests of both patients and medical students.

The Need for Curriculum Reform in Medical Ethics

One respondent in the Canadian survey noted that the requirement for consent for teaching procedures “was not explicitly explained to me and I believe more education should be provided in undergraduate education.” Our data strongly support this call for curricular reform. When we asked trainees about their hospital's consent process, 19.4% and 17.2% of anesthesiology residents in the two surveys answered “unclear,” compared to 4.2% of surgical residents and 12.8% of medical students. This high rate of uncertainty—particularly among anesthesia trainees—suggests that current education is insufficient.

Medical ethics curricula in China typically cover the principles of informed consent in general terms but rarely address the specific challenges of teaching settings. Students graduate without a clear understanding of: (1) whether they are permitted to perform procedures without explicit patient awareness of their trainee status; (2) how to disclose their role without biasing patient choice; (3) what to do if a faculty member asks them to perform a procedure whose consent status is unclear; and (4) the legal and regulatory framework governing trainee-performed procedures in their jurisdiction.

In today's context where research informed consent has been standardized, students must understand that it differs from teaching-related informed consent; the latter requires specialized learning and application.^[30]

We recommend that all medical schools and residency programs include a dedicated module on “Informed Consent in the Teaching Setting,” covering the ethical principles (autonomy, transparency, non-maleficence), the legal standards (what is required vs. aspirational), and practical communication skills (how to introduce oneself as a trainee, how to handle refusals gracefully). This module should be introduced during the clinical preparatory phase (just before clerkships) and reinforced during residency orientation. It is important to emphasize that: From a legal perspective, examining the compliance of informed consent constitutes an indispensable aspect of this field. The research encompasses the drafting of informed consent forms, documentation practices, and the delineation of legal responsibilities^[31]. We ultimately emphasize that patients must be provided with an adequate notice period prior to surgery to obtain relevant information, enabling them to carefully weigh their decisions.^[32]

Strengths and Limitations

This study has several strengths. It is the first large-scale, multi-specialty investigation of informed consent for teaching procedures in mainland China. The inclusion of three distinct trainee populations (surgery, anesthesiology, medical students) allows for meaningful comparisons across specialties and training stages. The survey instrument was piloted and administered across multiple institutions, enhancing generalizability within the region.

Several limitations must be acknowledged. First, the surgical resident sample (n=24) is relatively small, which limits power to detect some differences and may not fully represent the broader surgical trainee population. However, the consistency of findings with medical student data supports their validity. Second, data were collected from five independent cross-sectional surveys rather than a single coordinated sampling frame; however, the consistent patterns across cohorts (e.g., anesthesia residents consistently differed from surgical residents and medical students) support the robustness of the findings. Third, all data are self-reported and subject to recall and social desirability bias. Trainees may overreport their support for patient rights or underreport instances of performing procedures without clear consent. Fourth, we did not directly observe consent practices or patient outcomes, so associations between attitudes and actual behavior cannot be inferred. Fifth, the study was conducted in Anhui Province, which may not be representative of all Chinese teaching hospitals, particularly those in more developed (e.g., Beijing, Shanghai) or more rural regions. Sixth, we did not assess faculty or patient perspectives, which would be valuable for a complete understanding of the issue. Finally, the cross-sectional design prevents causal inferences about how attitudes change with training.

Research implications. Future research should: (1) explore patient perspectives in the Chinese context—how much do patients want to know about trainee involvement, and how does disclosure affect their willingness to consent? (2) evaluate the effectiveness of different consent models (tiered, bundled, separate) in maintaining both patient trust and trainee competence; (3) conduct longitudinal studies to track how attitudes toward consent change as trainees progress from medical school through residency; (4) investigate faculty perspectives,

as attending physicians ultimately control consent practices and teaching opportunities; and (5) examine whether targeted ethics education improves trainee confidence and skill in obtaining consent for teaching procedures.

Conclusions

This study finds that Chinese surgical and anesthesia trainees, along with medical students, value patient autonomy and informed consent, yet their preferences diverge by specialty and training stage: surgical residents and students favor strict separate consent, whereas anesthesia residents prefer a risk-stratified approach. Patient refusal primarily stems from distrust of trainee competence. Policies must balance patient rights with educational missions, as failure to do so may compromise training quality. Informed consent remains the cornerstone of physician–patient trust.

Ethics approval and consent to participate

This study was conducted within a standard educational and training setting and was classified as a project exempt from ethical review. The First Affiliated Hospital of the University of Science and Technology of China (USTC) Ethics Committee approved this study (Application Number 2026-KY-324).

This study had been performed in accordance with the principles stated in the Declaration of Helsinki. Data collection was conducted using an online questionnaire hosted on Wenjuanxing, with the instrument being composed in Chinese. The questionnaire was administered anonymously, and participants were informed from the outset that no personal privacy information would be collected. The questionnaire is not mandatory to complete; completion automatically indicates consent to participate in the study. Therefore, as there is no dedicated informed consent form for this questionnaire, participants may simply decline completion if they do not wish to participate.

Consent for publication

Not Applicable

Availability of data and materials

The data is stored in the Qwenxun software platform and can be accessed when needed. The original data and relevant materials generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Competing interests:

The authors declare that there are no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval

of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This study was supported by :

- Anhui Provincial Health Care Commission Health Research Project (AHWJ2024BAc30062);
- Anhui Provincial Teaching Quality and Reform Project (No. 2024xjyxm093) ;
- Anhui Provincial Teaching Quality and Reform Project (No. 2023jyxm1107) ;
- Anhui Provincial Teaching Quality and Reform Project (No. 2023jyxm1131) ;

Declaration of Generative AI Use

During the preparation of this manuscript, I used DeepSeek AI Assistant (DeepSeek-V3 large language model, version: DeepSeek-V3-2025-03) for language polishing and stylistic refinement. The tool was employed by inputting draft paragraphs into the system, which then suggested improvements in sentence structure, word choice, grammar, and coherence. All suggested changes were carefully reviewed and either adopted or rejected by me. The purpose of using this tool was to enhance the fluency and readability of the text, ensure accurate use of technical terminology, and improve logical flow, thereby facilitating clearer communication of the research. It is important to emphasize that all scientific content, data, conclusions, and core arguments are entirely my own work; the AI tool did not alter any substantive aspects of the research. I confirm that I am fully aware of and have complied with Taylor & Francis's ethical regulations on AI use, and I hereby make this disclosure accordingly.

Acknowledgement

The authors would like to express sincere gratitude to the editors and reviewers for their professional comments and helpful suggestions, which have greatly improved the quality of this manuscript.

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doi:10.1016/j.redar.2013.05.004

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- [SurveyQuestionnaireEnglishVersionInterns2025.docx](#)
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