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# Mind mapping combined with scenario simulation for medical interns' thoracentesis training

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| **Submission date**<br>07/06/2026 | **Recruitment status**<br>No longer recruiting | [_] Prospectively registered<br>[_] Protocol<br>[_] Statistical analysis plan<br>[_] Results<br>[_] Individual participant data<br>[X] Record updated in last year |
| **Registration date**<br>09/06/2026 | **Overall study status**<br>Completed | |
| **Last Edited**<br>09/06/2026 | **Condition category**<br>Other | |

**Plain English summary of protocol**
Not provided at time of registration

## Contact information

**Type(s)**
Principal investigator, Scientific, Public

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## Additional identifiers

## Study information

**Scientific Title**
Effect of mind mapping combined with scenario simulation on thoracentesis competence among medical interns: a randomized controlled trial

**Study objectives**

To evaluate whether integrating mind mapping as a cognitive scaffold followed by scenario simulation improves thoracentesis competence and learner satisfaction compared with traditional lecturebased instruction.

## Ethics approval required
Ethics approval required

## Ethics approval(s)
Approved 20/05/2025, Medical Ethics Committee of Lanzhou University Second Hospital (No. 80, Cuixingmen, Chengguan District, Lanzhou, 730030, China; +86 0931 894 2234; lzhtwo@lz.gs.cninfo.net), ref: 2025 A-588

## Primary study design
Interventional

## Allocation
Randomized controlled trial

## Masking
Blinded (masking used)

## Control
Active

## Assignment
Parallel

## Purpose
Health services research, Prevention

## Study type(s)

## Health condition(s) or problem(s) studied
Educational study on thoracentesis skill acquisition in healthy medical interns.

## Interventions
This study uses a randomized controlled design. The method of randomization is computer-generated random numbers (using SPSS software) in combination with sequentially numbered, opaque, sealed envelopes. The allocation sequence is generated by an independent statistician who is not involved in participant recruitment or outcome assessment.

Intervention group (MM+SS): 1hour mind mapping session (instructordeveloped mind map on “Thoracentesis Procedure” with four branches: preprocedure preparation, intraoperative steps, postprocedure care, precautions/complications), including 30 min individual selfstudy and 30 min collaborative smallgroup reconstruction. Followed by a 1hour scenario simulation using a standardized patient and highfidelity simulator, including historytaking, informed consent, physical examination, full procedural execution, unexpected event management (e.g., sudden cough), and a 10min structured debriefing (“What? So what? Now what?”). Finally, 2 hours of handson practice on a lowfidelity thoracentesis manikin, with recall of the mind map and simulation steps.

Control group (traditional lecture): 2hour lecture using PowerPoint covering anatomical landmarks, indications/contraindications, equipment, stepwise procedural execution (patient positioning, sterile preparation, local anesthesia, needle insertion, fluid aspiration, postprocedure monitoring), and complication management. Followed by 2 hours of handson practice on the same lowfidelity thoracentesis manikin (without scenario simulation or mind mapping).

### Intervention Type
Behavioural

### Primary outcome(s)
1. Skill performance on thoracentesis, comprising four domains: pre-procedure preparation, intra-operative technique, post-procedure care, and humanistic care & communication measured using the Modified Objective Structured Clinical Examination (OSCE) checklist at completion of the 4-hour training session (within 1 hour)

2. Teaching satisfaction, assessing (1) increased interest in procedural learning; (2) clarity of conceptual understanding; (3) appropriateness/feasibility of the teaching model; (4) overall satisfaction with the learning experience, measured using 4-item anonymous questionnaire, at completion of the 4-hour training session (within 1 hour)

### Key secondary outcome(s)

### Completion date
28/02/2026

## Eligibility

### Key inclusion criteria
1. Successful completion of core respiratory medicine coursework
2. No prior formal thoracentesis training
3. Full availability throughout the scheduled 2-week clinical rotation

### Healthy volunteers allowed
Yes

### Age group
Adult

### Lower age limit
20 Years

### Upper age limit
30 Years

### Sex
All

### Total final enrolment
60

**Key exclusion criteria**
Any unexcused absence of one or more days during the 2-week clinical rotation

**Date of first enrolment**
01/09/2025

**Date of final enrolment**
28/02/2026

## Locations

**Countries of recruitment**
China

## Sponsor information

**Organisation**
Lanzhou University Second Hospital

**ROR**
https://ror.org/02erhaz63

## Funder(s)

**Funder type**

**Funder Name**
Natural Science Foundation of Gansu Province

**Alternative Name(s)**
Gansu Provincial Natural Science Foundation, Gansu Natural Science Foundation

**Funding Body Type**
Government organisation

**Funding Body Subtype**
Local government

**Location**
China

## Results and Publications

## Individual participant data (IPD) sharing plan

### IPD sharing plan summary
Not expected to be made available