



ESC2026

VCOM

Report

HeartFocus DESKi





AI-Guided Echocardiography Training in Medical Students

SCIENTIFIC SUMMARY REPORT | ESC CONGRESS 2026

6.5-fold Higher odds of successful diagnostic-quality image acquisition **vs** Traditional training

♥ **37.7%** with in-person HeartFocus training **vs** 10.2% with traditional training alone

WHY THIS STUDY MATTERS

We wanted to understand whether AI guidance could improve how novice learners are taught to acquire cardiac ultrasound images - and whether HeartFocus could help make high-quality echo training more effective and scalable.

HOW WE RAN IT

A prospective randomized educational study with novice medical students, all using HeartFocus with a Butterfly handheld ultrasound. Students completed a standardized 4-hour training pathway and were randomized to:

- In-person HeartFocus training with AI guidance and trainer support
- Remote, self-guided HeartFocus training using tutorials and AI guidance alone
- Traditional expert-led training without AI guidance

All groups practiced on four standardized patients, enabling a direct comparison of traditional teaching versus AI-supported learning.

STUDY AT A GLANCE

- 29 preclinical medical students
- 3 training groups
- Half-day training intervention
- 10 standard transthoracic echocardiographic views
- Diagnostic quality assessed by a blinded experienced sonographer using ACEP criteria



Study design and methodology

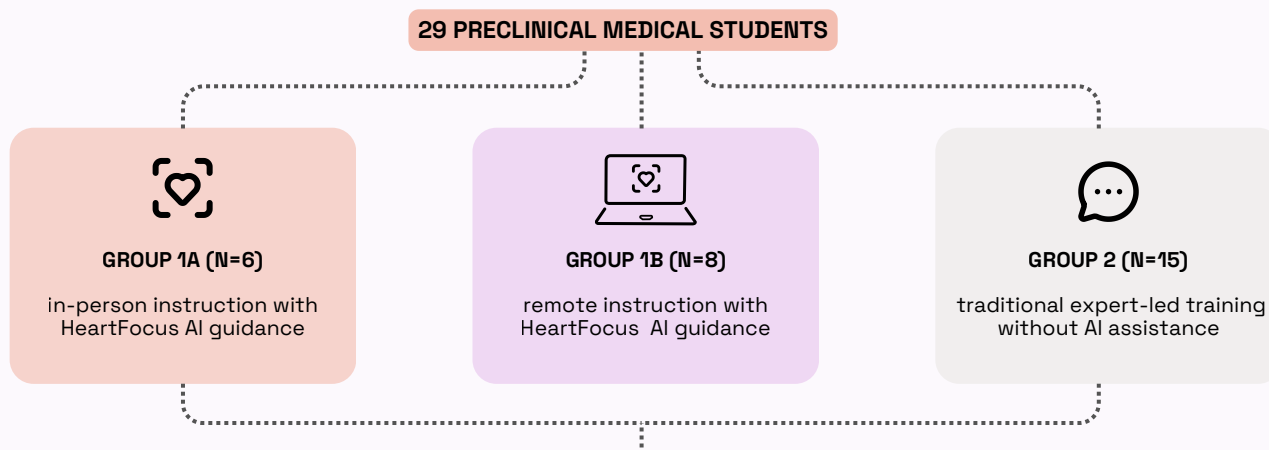
1 WHY THIS STUDY MATTERS

Echocardiography can support broader cardiac screening and education, but image acquisition remains highly operator-dependent.

Traditional training requires substantial expert supervision, which can limit scale and standardization.

Real-time AI guidance may help novice learners acquire standard transthoracic views more efficiently and consistently.

2 STUDY DESIGN



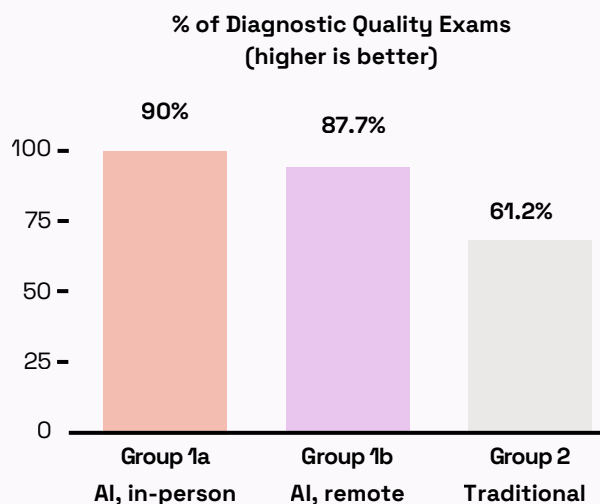
Following half-day training including practice on 4 standardized patients, participants performed 6 to 10 echocardiographic examinations on different standardized patients while acquiring 10 standard cardiac views.

3 PRIMARY ENDPOINT AND ASSESSMENT

- Primary endpoint: acquisition of diagnostic-quality echocardiographic clips
- Diagnostic quality defined as ACEP ≥ 3
- All clips were independently assessed by a blinded experienced sonographer
- Analysis used mixed-effects logistic regression accounting for clustering by standardized patient Exam-level endpoint

4 EXAM-LEVEL ENDPOINT

This is an exam-level endpoint from the poster materials, distinct from the clip-level primary result highlighted elsewhere.





Key results

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AI-supported training **significantly improved** diagnostic-quality image acquisition compared with traditional training.



Group 1a
AI, in-person
(226/600) **37.7%**
CLIP-LEVEL SUCCESS RATE

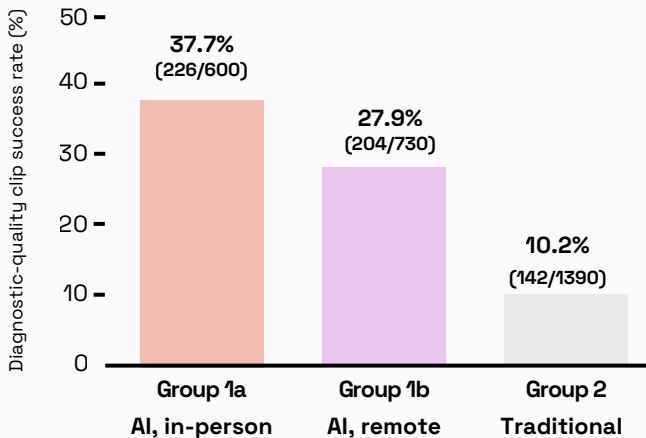


Group 1b
AI, remote
(204/730) **27.9%**
CLIP-LEVEL SUCCESS RATE

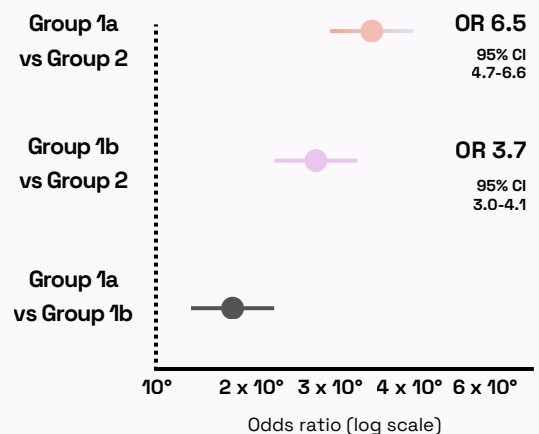


Group 2
Traditional
(142/1390) **10.2%**
CLIP-LEVEL SUCCESS RATE

Diagnostic-quality clip acquisition by training group
(Higher is better)



Odds of successful diagnostic-quality acquisition



INTERPRETATION

- The benefit observed in both in-person and remote AI-supported training groups suggests that AI-assisted instruction may offer a scalable approach to early echocardiographic training across multiple learning environments.

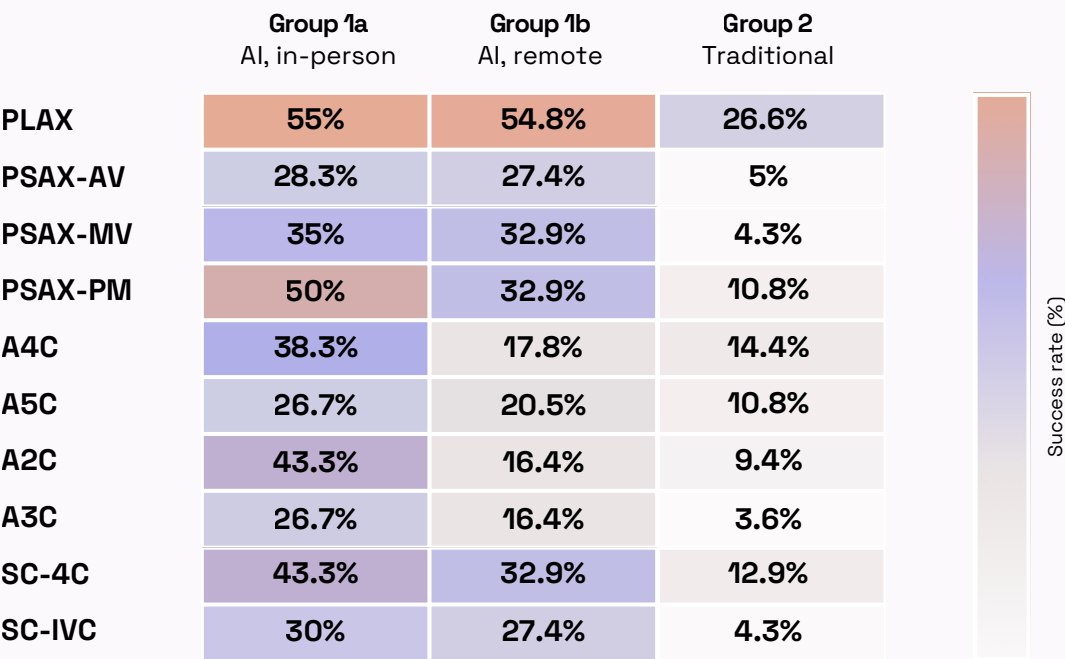
All results are from a prospective randomized educational study in 29 preclinical medical students.



View-level performance and implications

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DIAGNOSTIC-QUALITY SUCCESS RATES BY ECHOCARDIOGRAPHIC VIEW



Key observations

- AI-guided instruction improved diagnostic quality acquisition across all 10 standard views.
- Particularly strong absolute gains were observed in parasternal short-axis, apical two-chamber, and subcostal views.
- The benefit was observed in both in-person and remote AI-supported learning environments.

Implications for healthcare institutions

- May help standardize echocardiography skill acquisition across larger learner cohorts.
- May support more scalable cardiac ultrasound education with less dependence on continuous one-to-one expert supervision.
- May extend the reach of faculty across distributed and remote learning settings.
- May help build a stronger pathway from education to broader institutional adoption of cardiac ultrasound.

Key observations

- Modest sample size: 29 students and 10 standardized patients
- Educational study in novice preclinical medical students
- Evaluated image acquisition performance, not diagnosis, treatment decisions, or patient outcomes

Conclusions

- AI-guided echocardiography training significantly improved diagnostic-quality transthoracic image acquisition among novice medical students compared with traditional instruction.
- This benefit was observed in both in-person and remote AI-supported training formats, suggesting that AI guidance may help standardize skill acquisition among different learning environments.
- These findings suggest that AI-guided acquisition support may offer a scalable approach to standardizing echocardiography training and broadening access to cardiovascular imaging education.

Source: ESC Congress 2026 accepted abstract and poster materials; study conducted by Edward Via College of Osteopathic Medicine-Carolinas and DESKI