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AI-based versus human-led training for bronchoscopy

Submission date 30/01/2026	**Recruitment status** No longer recruiting	[_] Prospectively registered
		[_] Protocol
Registration date 06/02/2026	**Overall study status** Completed	[_] Statistical analysis plan
		[_] Results
Last Edited 05/02/2026	**Condition category** Surgery	[_] Individual participant data
		[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Residents in anesthesia and intensive care of the University of Milano-Bicocca without prior exposure to specific bronchoscopy training were enrolled to compare the AI-based to classical human-led training. Participants were assessed using the modified Bronchoscopy Skill and Task Assessment Tool (BSTAT) to evaluate the theoretical knowledge regarding the recognition of proximal bronchial anatomy (28 points total) and a practical component, assessing procedural positioning, airway wall trauma, correct intrabronchial scope position, and access to several tracheobronchial structures (27 points total). Of note, the proportion between the score driven by knowledge and practical component is similar to the original version of the BSTAT. Finally, similarly to the original BSTAT, the time required to complete the examination was recorded.

Who can participate?
Adult residents in anesthesia and intensive care.

What does the study involve?
Consent for the publication of data was obtained from residents. After a 1-hour frontal lecture on bronchoscopy and bronchial anatomy, the baseline bronchoscopy skills of all participants were tested using the BSTAT. Participants were thereafter randomized in a 1:1 ratio using sealed envelopes. The first group received classical training performed by an expert bronchoscopy instructor. The second group performed unsupervised training using the AI-based image recognition software. Each resident had 20 minutes of individual training and watched the individual training sessions of the other residents of her/his group. At the end of the training, each resident repeated the modified BSTAT. The assessment of the modified BSTAT was always performed by the same person, blinded to group allocation. Both baseline and post-training BSTAT examinations were conducted individually to prevent any learning effect from observation, ensuring that each resident's performance was based solely on their own training experience.

What are the possible benefits and risks of participating?
Benefits and risks not provided at time of registration

Where is the study run from?
University of Milan-Bicocca (Università degli Studi di Milano-Bicocca), Italy.

When is the study starting and how long is it expected to run for?
February 2024 to March 2024

Who is funding the study?
University of Milan-Bicocca (Università degli Studi di Milano-Bicocca), Italy.

Who is the main contact?
Prof Thomas Langer, thomas.langer@unimib.it

Contact information

Type(s)
Principal investigator, Scientific, Public

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Additional identifiers

Study information

Scientific Title
Artificial intelligence-based image recognition in bronchoscopy: a randomized controlled trial for
training evaluation in intensive care residents

Acronym
AI-BRITE Trial

Study objectives
The primary aim of this study is to compare the performance of residents in flexible
bronchoscopy after specific training, either AI-based or human-led. Specifically, we hypothesize
that the Bronchoscopy Skill and Task Assessment Tool (BSTAT) scores of residents undergoing
AI-based training are similar to those assigned to human-led training.

Ethics approval required
Ethics approval not required

Ethics approval(s)

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Open (masking not used)

Control
Active

Assignment
Crossover

Purpose
Educational- training

Study type(s)

Health condition(s) or problem(s) studied
Anesthesia Resident

Interventions
Participants are randomized in a 1:1 ratio using sealed envelopes. The first group receives classical training conducted by an expert bronchoscopy instructor. The second group performs unsupervised training using AI-based image recognition software. Each resident has 20 minutes of individual training and watches the individual training sessions of the other residents in her /his group. At the end of the training, each resident repeats the modified BSTAT.

Intervention Type
Other

Primary outcome(s)
1. Bronchoscopy knowledge and positioning skills measured using modified Bronchoscopy Skill and Task Assessment Tool (BSTAT), the minimum score is 0 (worst performance), and the maximum is 55 (perfect performance), at baseline (before training) and after training

Key secondary outcome(s))
1. The performance of residents in flexible bronchoscopy measured using the theoretical part of modified BSTAT, scores range from a minimum of 0 (worst performance) to a maximum of 27 (best performance), at baseline (before training) and after training

Completion date
01/03/2024

Eligibility

Key inclusion criteria

1. Residents in anesthesia and intensive care
2. Without prior exposure to specific bronchoscopy training
3. Accepted to participate

Healthy volunteers allowed

Yes

Age group

Mixed

Lower age limit

18 years

Upper age limit

99 years

Sex

All

Total final enrolment

22

Key exclusion criteria

Not meeting the key inclusion criteria

Date of first enrolment

01/02/2024

Date of final enrolment

29/02/2024

Locations

Countries of recruitment

Italy

Sponsor information

Organisation

University of Milano-Bicocca

ROR

https://ror.org/01ynf4891

Funder(s)

Funder type

Funder Name
Università degli Studi di Milano-Bicocca

Alternative Name(s)
University of Milano-Bicocca

Funding Body Type
Private sector organisation

Funding Body Subtype
Universities (academic only)

Location
Italy

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available