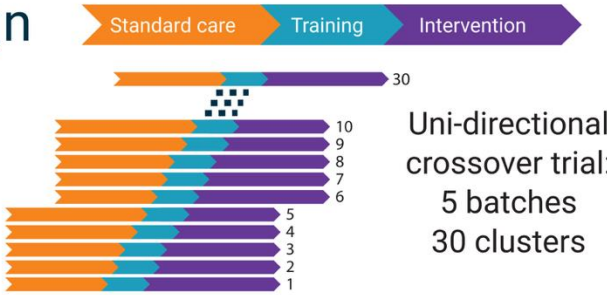
Trauma kills more than four million people each year

Advanced Trauma Life Support® (ATLS®)

has, for decades, been the most widely adopted programme for training physicians to resuscitate and manage trauma patients. However, there is still no conclusive evidence that ATLS® improves patient outcomes.

How does ATLS® training impact patient outcomes in comparison to standard care in adult trauma patients?

Study design



Batched stepped-wedge cluster randomised trial comparing ATLS® vs standard care

Uni-directional crossover trial:
5 batches
30 clusters

Population

Adult trauma patients in 30 hospitals across India
Target n>4320 patients

Primary outcome comparison

Standard care
In-hospital mortality within 30 days of arriving at the ED

ATLS® training

Intervention
Does ATLS® reduce in-hospital mortality from 20% to <15%?

If ATLS® improves patient outcomes it should be further promoted

OR

If ATLS® does not improve patient outcomes, trauma life support training needs to change

Effects of Advance Trauma Life Support® Training Compared to Standard Care on Adult Trauma Patient Outcomes: A Stepped-Wedge Cluster Randomised Trial
Gerdin Wärnberg et al. (2025) ADVANCE TRAUMA Trial Protocol

ANIMATE YOUR SCIENCE™

ADVANCE TRAUMA

Effects of Advanced Trauma Life Support® Training Compared to Standard Care on Adult Trauma Patient Outcomes: A Stepped-Wedge Cluster Randomised Trial

Protocol Summary

TRAUMA EDUCATION

Advanced Trauma Life Support

The Advanced Trauma Life Support® (ATLS®) program can teach you a systematic, concise approach to the care of a trauma patient. First introduced in 1980, ATLS has now been taught to more than 1 million clinicians in more than 80 countries around the world.

ATLS Course Management System
Manage your courses

MyATLS App
Learn more!

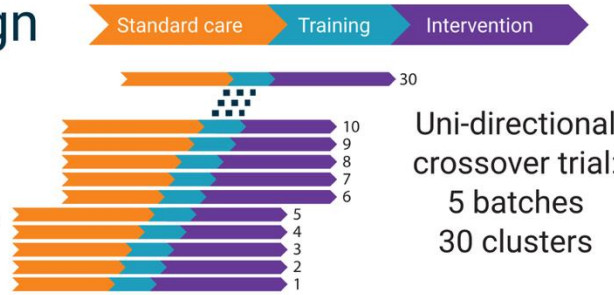
Trauma kills more than four million people each year

Advanced Trauma Life Support® (ATLS®)

has, for decades, been the most widely adopted programme for training physicians to resuscitate and manage trauma patients. However, there is still no conclusive evidence that ATLS® improves patient outcomes.

How does ATLS® training impact patient outcomes in comparison to standard care in adult trauma patients?

Study design



Batched stepped-wedge cluster randomised trial comparing ATLS® vs standard care

Uni-directional crossover trial:
5 batches
30 clusters

Population

Adult trauma patients in 30 hospitals across India
Target n>4320 patients

Primary outcome comparison

Standard care
In-hospital mortality within 30 days of arriving at the ED

ATLS® training

Intervention
Does ATLS® reduce in-hospital mortality from 20% to <15%?

If ATLS® improves patient outcomes it should be further promoted

OR

If ATLS® does not improve patient outcomes, trauma life support training needs to change

Effects of Advance Trauma Life Support® Training Compared to Standard Care on Adult Trauma Patient Outcomes: A Stepped-Wedge Cluster Randomised Trial
Gerdin Wärnberg et al. (2025) ADVANCE TRAUMA Trial Protocol

ANIMATE YOUR SCIENCE™

Trauma

Scope of the problem

>4

million deaths globally

~2

million quality-related deaths in LMIC

$4.2

trillions in the US alone

#1

cause of disease burden in people aged 10-49 years

ATLS

Purpose and content

"emphasizes the rapid initial assessment and primary treatment of injured patients, starting at the time of injury and continuing through **initial assessment, lifesaving intervention, reevaluation, stabilization**, and, when needed, **transfer** to a trauma center"

> ATLS® Student Course Manual. 10th ed. 2018.

ATLS

Spread and dissemination

1978
first course

>80
countries
worldwide

>1
million physicians
trained

ATLS

Impact on providers' knowledge and skills

"There is abundant evidence that ATLS training improves the **knowledge base, the psychomotor skills and their use in resuscitation**, and the **confidence and performance** of doctors who have taken part in the program. The organization and procedural skills taught in the course are retained by course participants for at least 6 years, which may be the most significant impact of all"

> ATLS® Student Course Manual. 10th ed. 2018.

ATLS

Evidence of impact on providers' knowledge and skills

Three randomised controlled studies:

1. **Ali J et al. 1995:** "Using highly reliable trauma OSCE stations we have demonstrated trauma management skills acquisition by senior medical students after the ATLS course."
2. **Ali J et al. 1996:** "… improvement in OSCE scores, adherence to trauma priorities, maintenance of an organized approach to trauma care, and cognitive performance in MCQ examinations."
3. **Ali J et al. 1999:** "Using standard ATLS pass criteria, performance after the new and old ATLS courses was similar."

ATLS

Impact on patient outcomes

“ATLS training in a **developing country has resulted in a decrease in injury mortality**. **Lower per capita rates of deaths** from injuries are observed in areas where providers have ATLS training. In one study, a small trauma team led by a doctor with ATLS experience had **equivalent patient survival** when compared with a larger team with more doctors in an urban setting. In addition, there were more **unexpected survivors than fatalities**”

> ATLS® Student Course Manual. 10th ed. 2018.

ATLS

Evidence of impact on patient outcomes

Four systematic reviews:

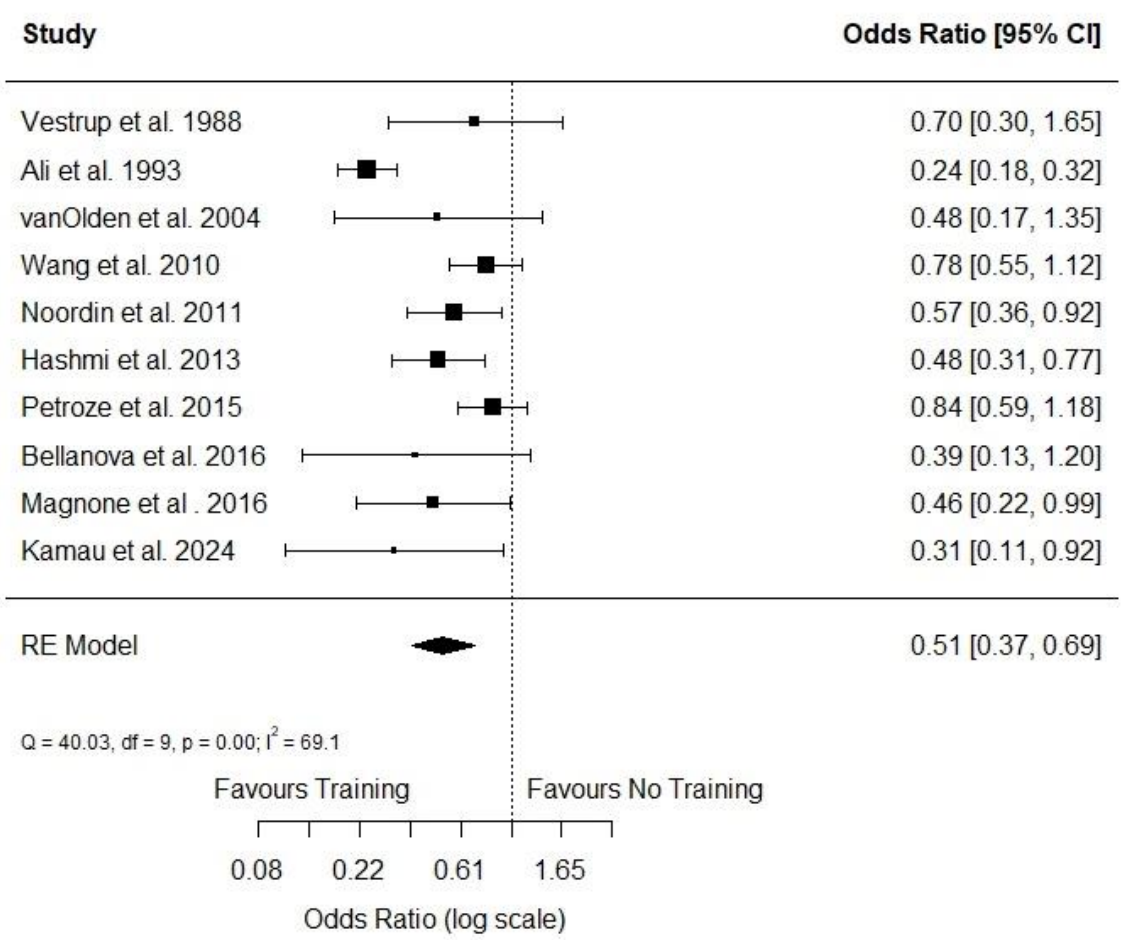
1. **Mohammad A et al. 2013:** “Future studies are required to properly evaluate the impact of ATLS training on trauma death rates and disability.”
2. **Jayaraman S et al. 2014:** “There is no evidence from controlled trials that ATLS or similar programs impact the outcome for victims of injury.”
3. **Jin J et al. 2021:** “In-hospital trauma training with certified courses resulted in a reduction of mortality (RR 0.71, 95% CI 0.62 to 0.78).”
4. **Putra AB et al. 2023:** “ATLS had no significant effect in reducing the risk of mortality (OR: 0.68; 95% CI 0.39 – 1.20; p = 0.18).”

ATLS

Evidence of impact on patient outcomes

Updated systematic review:

- search in August 2025;
- screened 9,656 records;
- included 10 observational studies; and
- estimated a pooled odds ratio of 0.51.



ATLS

Critique

- Costly
- Perpetuate theories despite evidence of the contrary
- Not adapted to modern trauma care
- Not adaptable to local circumstances
- Fixed didactic nature

Aim

To compare the effects of ATLS® training with standard care on outcomes in adult trauma patients

Design

Key aspects and justification

Study design

Batched stepped-wedge cluster randomised trial:

- 30 hospitals
- 6 batches
- 5 sequences
- 13 months in trial

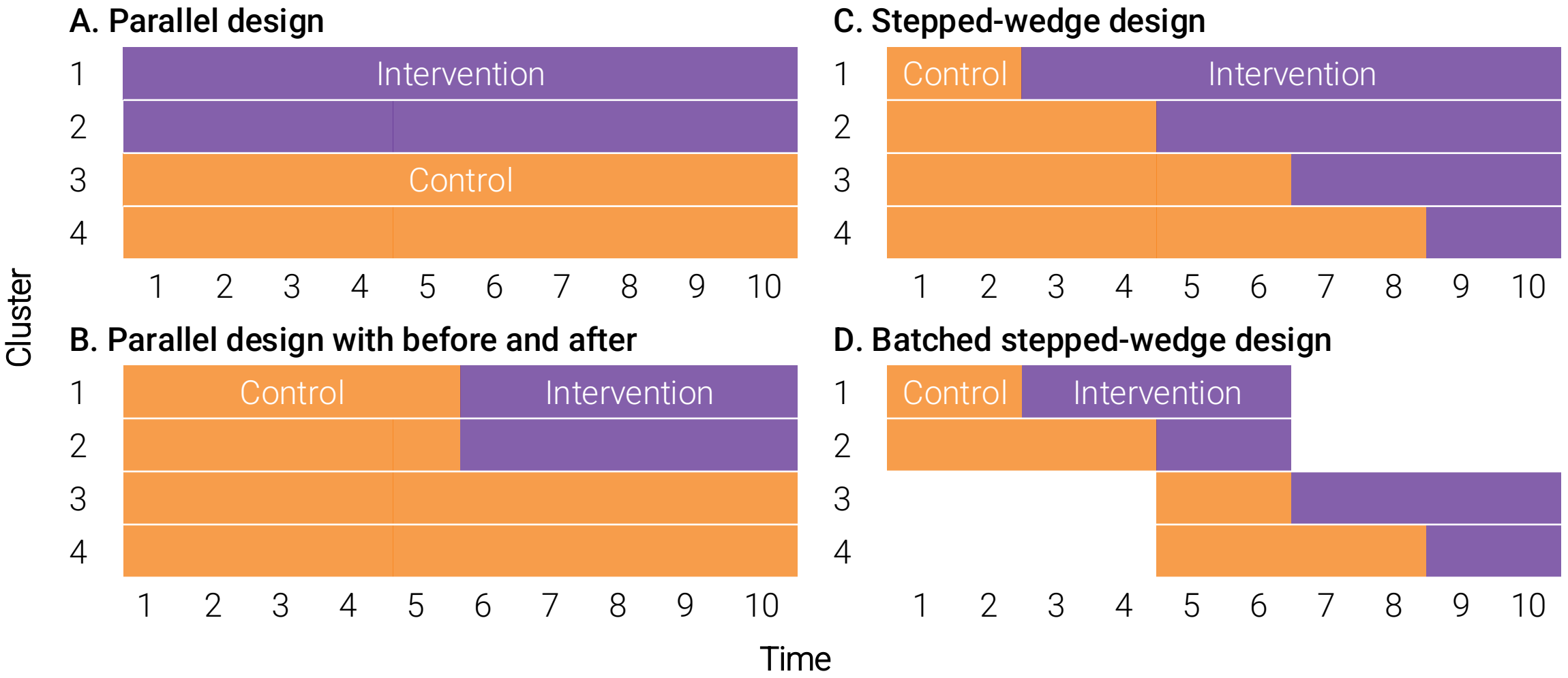
Justification

Is conducted in **India** because:

- Ongoing collaborations > 10 years
- ATLS training not yet standard

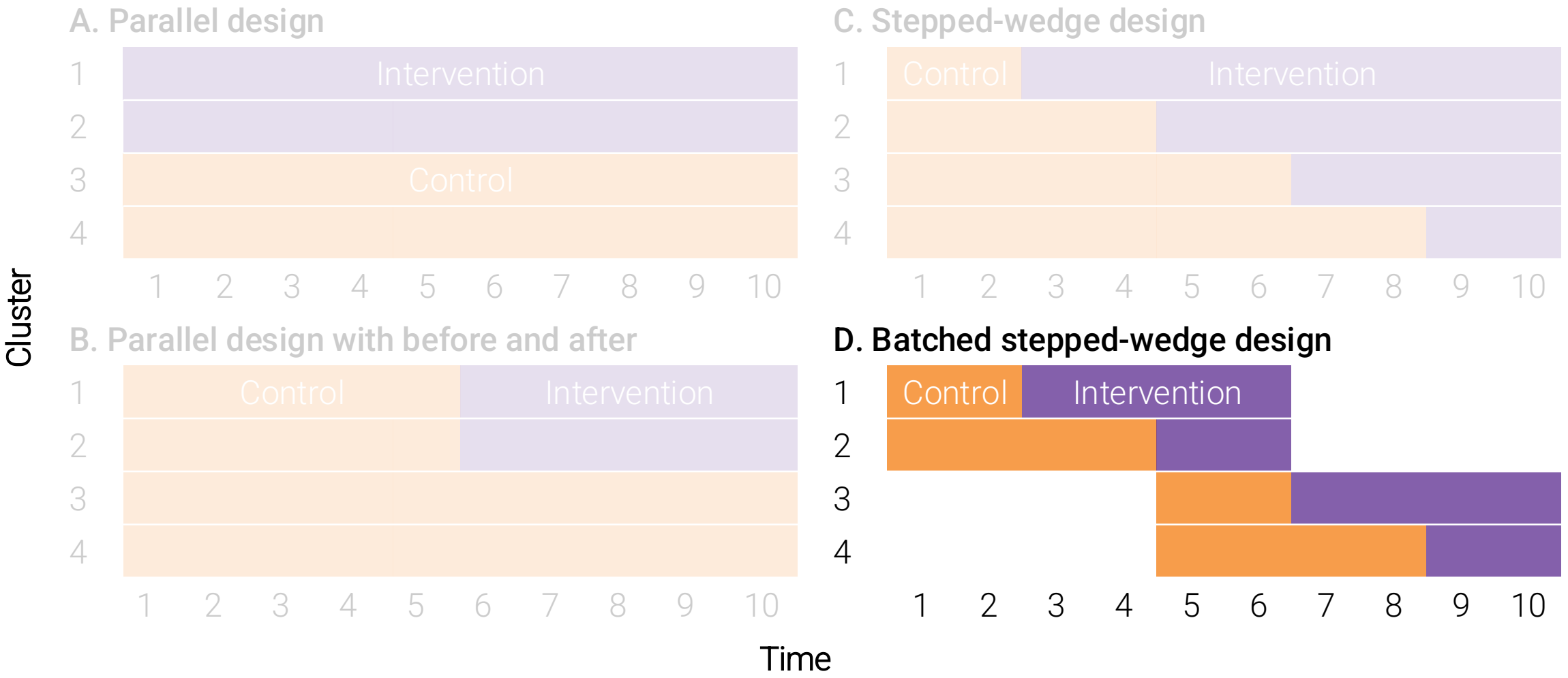
Design

Cluster randomised designs



Design

Cluster randomised designs

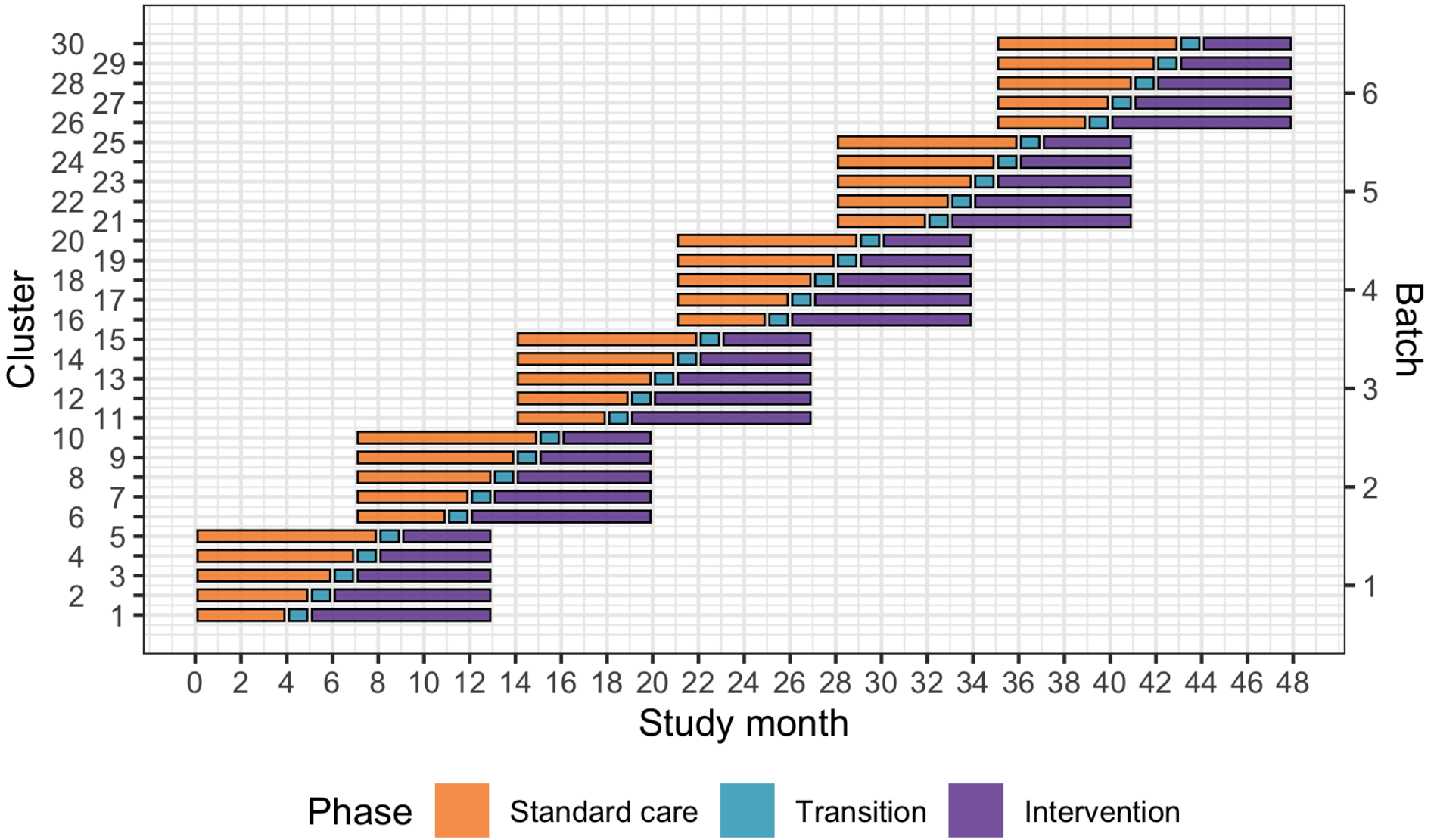


Primary outcome

30-day in-hospital mortality

- Collected through medical records for patients admitted or discharged home
- Collected through telephonic follow-up for patients transferred to another hospital

Main Design


Cluster
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Batch
6
5
4
3
2
1
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Study month
Phase
Standard care
Transition
Intervention

Secondary outcomes

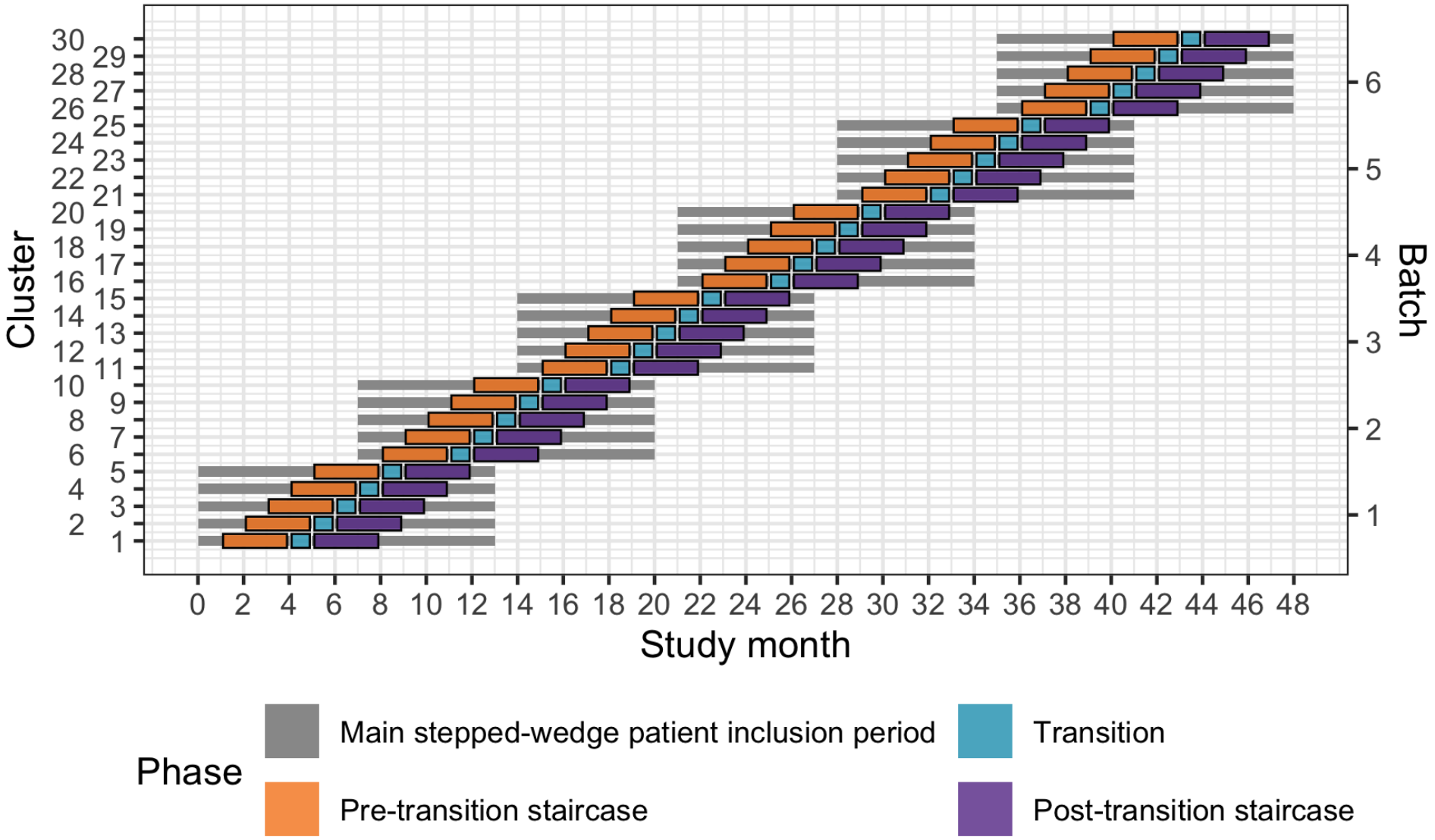
All patients using main stepped-wedge design:

- **All cause and in-hospital mortality** at 24 hours, 30 days and 90 days
- **Length of stay,** in the ED, ICU and hospital
- **Return to work,** measured at 30 days and 90 days

Random subset of patients using nested staircase design

- **Adherence to ATLS principles,** collected through observations
- **Quality of life,** measured using EQ5D5L at 30 days and 90 days
- **Disability,** measured using WHODAS 2.0 at 30 days and 90 days

Nested staircase design



Eligibility criteria

Cluster

One or more units of physicians providing initial trauma care in the secondary or tertiary hospitals that admit or refer/transfer for admission at least 400 patients with trauma per year

Patient

Adult trauma patients presenting to the emergency department of participating hospitals and who are admitted

Intervention and control

ATLS and standard care

Control

- Standard care varies across hospitals in India
- Trauma patients are initially managed by 1st or 2nd year resident
- No formal trauma life support training

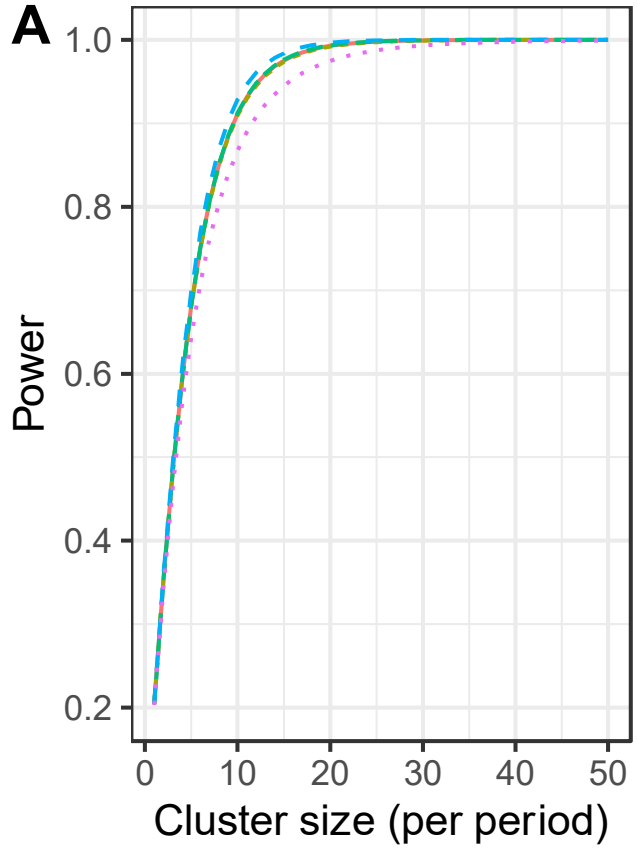
Intervention

- 2.5 day ATLS training course
- Accredited ATLS training facility in India
- 1-2 units per hospital

Sample size

Effect size, clusters and patients

- Detect a reduction in 30-day in-hospital mortality from 20 to 15% with 90% power
- 30 clusters
- At least 4320 patients
- Requires at 12 patients per cluster and period (month)



Trial organisation

Main applicants

Martin Gerdin Wärnberg
Ass. Professor

Karla Hemming
Professor

Nobhojit Roy
Lead, Program for Global Surgery & Trauma

Lisa Strömmer
Ass. Professor

Li Felländer-Tsai
Professor

Vivekanand Jha
Executive Director, Professor

Karolinska Institutet

UNIVERSITY OF BIRMINGHAM

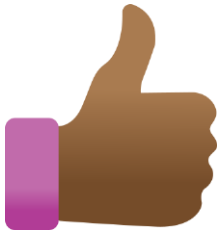
The George Institute for Global Health

Current Status

Progress and funding

- First batch ongoing since February 2025
- ~900 included patients
- Second batch will start in December
- Expect to continue until December 2028, pending more funding

Implications



If ATLS improves patient outcomes it should be further promoted

If it does not, then trauma life support training needs to change

ADVANCE TRAUMA

Effects of Advanced Trauma Life Support® Training Compared to Standard Care on Adult Trauma Patient Outcomes: A Stepped-Wedge Cluster Randomised Trial

Protocol Summary