









# The Adelaide Score: prospective implementation of an artificial intelligence system to improve hospital and cost efficiency

Joshua G. Kovoov \*,† Brandon Stretton ,‡‡ Aashray K. Gupta ,†§ Alexander Beath,\*  
Mathew O. Jacob \*, John M. Kefalianos \*, Gavin J. Carmichael ,\*¶¶ Ammar Zaka,|| Gerry O'Callaghan,‡‡  
Shrirajh Satheakeerthy,‡ Andrew Booth,‡ Thomson Delloso ,‡ Thomas J. Hugh ,§§\*\* Weng Onn Chan,‡‡‡  
Guy J. Maddern,‡‡‡ Eva Balan-Vnuk,‡‡ Michael Cusack,‡‡ Toby Gilbert,†§§ John Maddison,†§§  
Stephen Bacchi,§§¶¶¶¶ and on behalf of the Adelaide Score Advisory Group,

\*Ballarat Base Hospital, Ballarat, Victoria, Australia

†University of Adelaide, Adelaide, South Australia, Australia

‡Royal Adelaide Hospital, Adelaide, South Australia, Australia

§Royal North Shore Hospital, Adelaide, South Australia, Australia

¶¶University of Melbourne, Ballarat, Victoria, Australia

||Gold Coast University Hospital, Gold Coast, Queensland, Australia

\*\*University of Sydney, Sydney, New South Wales, Australia

‡‡The Queen Elizabeth Hospital, Adelaide, South Australia, Australia

‡‡‡SA Government, Adelaide, South Australia, Australia

§§Lylell McEwin Hospital, Adelaide, South Australia, Australia

¶¶¶Massachusetts General Hospital, Boston, Massachusetts, USA and

|||Harvard University, Boston, Massachusetts, USA

## Key words

artificial intelligence, cost saving, efficiency, the Adelaide score.

## Correspondence

Dr Joshua Kovoov, Ballarat Base Hospital,  
1 Drummond St N, Ballarat Central VIC 3350,  
Australia.

Email: [joshua.kovoov@adelaide.edu.au](mailto:joshua.kovoov@adelaide.edu.au)

**J. G. Kovoov** MS; **B. Stretton** MClinEd;  
**A. K. Gupta** MS; **A. Beath** MD;  
**M. O. Jacob** MMIS; **J. M. Kefalianos** MD;  
**G. J. Carmichael** BSc; **A. Zaka** MD;  
**G. O'Callaghan** MBChB;  
**S. Satheakeerthy** MBBS; **A. Booth** MBBS;  
**T. Delloso** BN; **T. J. Hugh** MD;  
**W. O. Chan** MPhil; **G. J. Maddern** PhD;  
**E. Balan-Vnuk** PhD; **M. Cusack** MBBS;  
**T. Gilbert** MBChB; **J. Maddison** MBBS;  
**S. Bacchi** PhD on behalf of

Accepted for publication 22 December 2024.

doi: 10.1111/ans.19383

## Abstract

**Background:** The Adelaide Score is an artificial intelligence system that integrates objective vital signs and laboratory tests to predict likelihood of hospital discharge.

**Methods:** A prospective implementation trial was conducted at the Lylell McEwin Hospital in South Australia. The Adelaide Score was added to existing human, artificial intelligence, and other technological infrastructure for the first 28 days of April 2024 (intervention), and outcomes were compared using parametric, non-parametric and health economic analyses, to those in the first 28 days of April 2023 (control). Artificial intelligence evaluated inpatients admitted under 18 surgical and medical teams, and patients of high likelihood of discharge were provided, on working shifts between Thursday to Sunday, to the Supportive Weekend Interprofessional Flow Team (SWIFT) comprising a senior nurse and pharmacist.

**Results:** Two thousand nine hundred and sixty-eight admissions were included across intervention and control periods. Relative to the control group, use of the Adelaide Score in the intervention group resulted in significantly shorter median length of stay (3.1 versus 2.9 days,  $P = 0.028$ ) and significantly lower seven-day readmission rate (7.1 versus 5.0%,  $p = 0.02$ ). The 0.2 bed-day reduction in median length of stay produced a cost saving of \$735 708.60 across the 28-day period, or \$9 564 211.80 across a 52-week year. There was no significant difference between intervention and control groups in median length of stay for patients discharged on weekends, in-hospital mortality, or discharge to non-home destinations.

**Conclusions:** The prospective implementation of the Adelaide Score was associated with improved hospital and cost efficiency, alongside lower readmissions, for patients across surgical and medical services.