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# Accelerated Chest Pain Risk Evaluation (ACRE)

Initiative Type

Model of Care

Status

Deliver

Added

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<https://cnxp3cuvtvrn68yjaibaht5ywrxspj7m.clinicalexcellence.qld.gov.au/improvement-exchange/acre>

## Summary

The Accelerated Chest Pain Risk Evaluation (ACRE) project is a statewide project supported by the Healthcare Improvement Unit. The ACRE project aims to facilitate implementation of the best evidence for the safe and efficient evaluation of patients presenting to emergency department (EDs) with possible cardiac chest pain. The project utilises clinical redesign methodology to support adoption of accelerated diagnostic protocols (ADPs) that are evidence-based, safe, and patient

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focused. Since 2012, the ACRE project has worked with EDs across Queensland to implement the most current, evidence-based ADPs, thereby improving the evaluation of patients with possible cardiac chest pain. This has resulted in reduced length of stay (both ED and total hospital stay) and hospital admissions through implementation of protocols able to safely and rapidly assess patients at low and intermediate risk of Acute Coronary Syndrome (ACS). From 2012 to 2015, the ACRE project initiated implementation of the ADAPT protocol in 19 hospitals. From 2016-2018, the Improved Assessment of Chest pain Trial (ImpACT) protocol was implemented in 9 hospitals. With the [introduction of the high sensitivity troponin assay](#) in late 2018, the ACRE team is working with Queensland hospitals to promote the most effective utilisation of this assay by introducing accelerated patient management protocols. This includes facilitating the implementation of a 3 hour assessment timeframe for high risk patients in addition to the safe and efficient management of low and intermediate risk patients. Due to upgrades to testing instruments, Pathology Queensland (PQ) are introducing a new high sensitivity cardiac troponin assay to all Queensland Health laboratories throughout 2022. For more information about the new troponin assay, visit the Resources page.

### Key dates

Apr 2012

Jun 2019

### Implementation sites

New Troponin Assay implementation sites: all 33 Q Health hospitals with a pathology laboratory.  
ImpACT protocol sites: Cairns, Ipswich, SCUH, Nambour, Bundaberg, QE II, Rockhampton, Mackay, Gladstone. ADAPT implementation sites: 19 including pilot site.

### Partnerships

Royal Brisbane and Women's Hospital

## Key Contacts

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## **Aim**

The ACRE project aims to facilitate adoption of the best available evidence for the assessment of patients presenting to emergency departments (EDs) with possible cardiac chest pain. Widespread application of clinical redesign methodology enables implementation of recently researched accelerated diagnostic protocols.

## **Benefits**

The ACRE team strives to ensure patients receive the best available care given resources available and recent evidence.

Improved efficiency of assessment resulting in

- A reduction in length of hospital stay
- A reduction in hospital admissions
- A reduction in objective testing of patients at low risk of major adverse cardiac events

## **Background**

Each year in Australia an estimated 500,000 patients present to hospital emergency departments with possible cardiac chest pain, accounting for up to 10 per cent of all presentations. However, up to 85 per cent of patients with chest pain are found to not have an ACS after lengthy investigation (traditionally >8 hours) or admission for diagnostic workup. The emergence of ADPs and new assays for troponin support safe accelerated assessment of patients, and set the scene for clinical redesign and the translation of recent clinical research into practice.

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## Solutions Implemented

### **2022 ongoing: Introduction of the Siemens Atellica IM High-Sensitivity Troponin I assay**

The new high sensitivity cardiac troponin assay is being implemented in a staged roll-out across Queensland Health laboratories throughout 2022 as instruments are upgraded. The new assay and assessment strategy have been validated in a prospective, multi-centre trial of more than 2000 patients across six Queensland hospitals. Further testing will continue throughout the course of the roll-out.

**2018 - 2022: Accelerated care utilising the New Troponin Assay for Queensland Health** The introduction of the Beckman Coulter Access hsTnI assay across Queensland provided important and exciting implications for the assessment of patients with possible cardiac chest pain. This change was a great opportunity for emergency departments to adopt the best evidence-based care available. The ACRE project team worked with Queensland Health hospitals with access to laboratory testing to implement the most appropriate, safe, and efficient accelerated diagnostic protocol (ADP) based on the capacity and resources of each facility. **2016 – 2018: Improved Assessment of Chest pain Trial (ImpACT) protocol Rollout** The second stage of the ACRE project involved implementing the [Improved Assessment of Chest pain Trial \(ImpACT\)](#) protocol, an accelerated diagnostic protocol for assessment of patients with possible cardiac chest pain. Translating research findings into practice, the project has made rapid improvements in the assessment process of patients presenting with chest pain to Queensland emergency departments. The ImpACT pathway has two components which encompass up to 75 per cent of patients presenting to emergency departments with possible cardiac chest pain. Firstly, a low risk group who can receive accelerated assessment to rule out acute coronary syndrome (ACS) after 2 hours, and no longer require additional objective testing for coronary artery disease. Secondly, an intermediate risk group who can be assessed to exclude ACS after 2 hours and an inpatient exercise stress test. **2017-18: ImpACT Aboriginal and Torres Strait Islander Research Project** This research represents a side project of the ACRE project, to validate use of the ImpACT protocol in Aboriginal and Torres Strait Islander patients. It is supported by a partnership grant from the Australian Centre for Health Services Innovation (AusHSI) **2012 – 2016: ADAPT ADP Pilot and Rollout** A pilot implementation of the [ADAPT ADP](#) to Nambour Hospital in 2012 prompted the inception of the ACRE Project. The ADAPT research allowed 20 per cent of patients presenting with possible cardiac chest pain to safely undergo accelerated care, and successful translation of these results into clinical practice led to funding under the Health Innovation Fund for widespread rollout.

## Evaluation and Results

**ADAPT Pilot** Nambour General Hospital was selected as a pilot site to implement a clinical redesign by introducing the recently researched ADAPT Protocol into practice. Consistent with the research, the new clinical process safely identified approximately 20 per cent of patients at low risk of ACS who could be discharged home for outpatient exercise stress test (EST). Published outcomes include an average ED length of stay reduction of 81 minutes for patients presenting to ED with possible cardiac chest pain, resulting in increased compliance to the National Emergency Access Targets (NEAT). No major adverse cardiac events were reported. ([Introduction of an accelerated diagnostic protocol in the assessment of emergency department patients with possible acute coronary syndrome: The Nambour Short Low/Intermediate Chest pain project](#)). **ADAPT Rollout** An evaluation of the ACRE

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project ([Implementing change: evaluating the Accelerated Chest pain Risk Evaluation \(ACRE\) project, 2017](#)) was published in the Medical Journal of Australia showing reduction of emergency department length of stay and fewer hospital admissions. The release in financial capacity resulting from these reductions was estimated at \$13.5 M. **Improved Assessment of Chest pain Trial (ImpACT) Rollout** [The Improved Assessment of Chest pain Trial \(ImpACT\) \(2017\)](#) was published in the Medical Journal of Australia and showed safe, effective risk stratification and management for patients presenting to the Emergency Department (ED) with suspected acute coronary syndrome (ACS). The ImpACT protocol safely allows low risk patients to be discharged with no further testing, and intermediate risk patients to undergo accelerated care (ECG and TnI at 0 and 2 hours, followed by inpatient objective testing). It does not change the care of high risk patients. At the announcement of the new troponin assay in September 2018, the ImpACT protocol had been rolled out to 9 sites. Preliminary results showed improved care and management of patients presenting to the ED with suspected ACS. [ImpACT Aboriginal and Torres Strait Islander Research Project](#) It is acknowledged by the researchers of the original ImpACT study that Aboriginal and Torres Strait Islander patients were underrepresented. The increased burden of cardiovascular disease among these populations is well known, but there is a lack of evidence around exactly how this affects their risk stratification. The ImpACT Aboriginal and Torres Strait Islander Research Project aims to describe the risk stratification and outcomes for Aboriginal and Torres Strait Islander people assessed with the ImpACT protocol. The study is being conducted in partnership with the ACRE Project Team (sponsored by the Queensland Health Clinical Excellence Division), the Australian Centre for Health Services Innovation (AusHSI) and Cairns Hospital. The research team acknowledges and pays respect to the Traditional Owners and the Aboriginal and Torres Strait Islander Elders, People, Consumers, and Staff, past and present, on whose land we carry out research. The research has received formal support from the following organisations:

- Wuchopperen Health Service Limited
- Gurriny Yealamucka Health Service Aboriginal Corporation
- Apunipima Cape York Health Council
- Aboriginal and Torres Strait Islander health management unit, Cairns and Hinterland Hospital and Health Service

## Lessons Learnt

- Key stakeholder engagement is essential
- A strong evidence base from locally derived research is invaluable
- Clinician-led projects support rapid adoption of change
- Adaptability to local processes is crucial
- Continual feedback and communication is necessary
- Small individual improvements = large scale gains

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## References

Than M, Cullen L, Aldous S, et al. [2-Hour Accelerated Diagnostic Protocol to Assess Patients With Chest Pain Symptoms Using Contemporary Troponins as the Only Biomarker: The ADAPT Trial](#). J Am Coll Cardiol. 2012; 59 (23):2091-8. George T, Ashover S, Cullen L, et al. [Introduction of an accelerated diagnostic protocol in the assessment of emergency department patients with possible acute coronary syndrome: The Nambour Short Low-Intermediate Chest pain project](#). Emerg. Med. Australas. 2013; 25: 340-344. Skoien, W., Page, K., Parsonage, W., Ashover, S., Milburn, T. and Cullen, L., 2016. [Use of the Theoretical Domains Framework to evaluate factors driving successful implementation of the Accelerated Chest pain Risk Evaluation \(ACRE\) project](#). Implementation Science, 11(1), p.136. Parsonage, W.A., Milburn, T., Ashover, S., Skoien, W., Greenslade, J.H., McCormack, L. and Cullen, L., 2017. [Implementing change: evaluating the Accelerated Chest pain Risk Evaluation \(ACRE\) project](#). Med J Aust, 207, pp.201-5. Cullen, L., Greenslade, J.H., Hawkins, T., Hammett, C., O'Kane, S., Ryan, K., Parker, K., Schluter, J., Dalton, E., Brown, A.F. and Than, M., 2017. [Improved Assessment of Chest pain Trial \(IMPACT\): assessing patients with possible acute coronary syndromes](#). Med J Aust, 207(5), pp.195-200.

## Further Reading

**Paper** [A Large Scale Implementation of the Adapt Accelerated Diagnostic Protocol into Clinical Practice in Queensland: Impact on Hospital Length of Stay and Admission Rates for Possible Cardiac Chest Pain Awards](#) 2016 - Ko Awatea International Excellence in Health Improvement Awards, Award for Promoting Clinical Research and Application to Practice Winner – [Effective translation of local research into widespread clinical practice – outcomes of the Queensland Accelerated Chest pain Risk Evaluation \(ACRE\) Project](#) 2018 - Metro North Research Excellence Awards, Chief Executive's Award Winner - [Professor Louise Cullen, The ACRE project](#) 2017 - 26th annual Royal Brisbane and Women's Hospital (RBWH) Healthcare Symposium, Complex Health Challenges Research Award Winner - Professor Louise Cullen, [Improved assessment of chest pain trial \(IMPACT\): assessing patients with possible acute coronary syndromes](#) 2016 - 64th Annual Scientific Meeting of the Cardiac Society of Australia and New Zealand, [Cardiovascular Nursing Lecture and Nursing Prize Finalist](#) 2016 - Health Services Research Association, Australia and New Zealand, Best Impact Project Award Runner up – [The Statewide Accelerated Chest Pain Risk Evaluation \(ACRE\) Project](#)

## Resources

[i-STAT Reference Ranges](#)

[Clinical Interpretation of High Sensitivity Cardiac Troponin](#)

[Cardiac Troponin Assay - Frequently Asked Questions](#)

[ACRE Newsletter January 2019](#)

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[ACRE Newsletter July 2018](#)

[ACRE Newsletter September 2017](#)

[ACRE Newsletter May 2017](#)

[The ACRE Project Statewide Outcome Report June 2016](#)

[The ACRE Project Outcome Evaluation Report February 2016](#)

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