

Ensuring access to invasive care for all patients with acute coronary syndromes: beyond our reach?

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We need to ensure that those who need care most receive it

Coronary artery disease (CAD) remains the leading cause of death and disability in Australia, with suspected acute coronary syndromes (ACS) being the most common reason for acute presentation to hospital.¹ A substantial body of evidence supports the early use of invasive care — coronary angiography and, if appropriate, revascularisation (either by percutaneous coronary intervention [PCI] or coronary artery bypass grafting [CABG]) — in patients presenting with ST-elevation myocardial infarction to reduce mortality and re-infarction rates.² Evidence and expert opinion also favour invasive management of patients with high risk, troponin-positive non-ST-elevation ACS (NSTEMACS).^{3,4} In patients with stable CAD, there is no evidence for any benefit from invasive care if optimal medical therapy is administered.⁵ Access to invasive care should be in accordance with clinical need, and this is likely to be greater in populations with a higher prevalence of CAD, CAD-related deaths, and coronary risk factors.

In this issue of the *MJA*, a large ecological study encompassing the entire population of 61 (former) Medicare Locals and using information from several databases identified associations between socio-economic, geographic and chronic cardiovascular disease factors and ACS incidence and mortality rates.⁶ Chew and colleagues also examined whether rates of invasive care (coronary angiography being the key measure) were correlated with indicators of disease burden, access to care, and clinician practice.

The study had some limitations. Data were analysed and associations between different variables (presumed to be linear) defined at the population rather than at the individual level; data on private hospital admissions were missing for three of eight state or territory jurisdictions; rates of ACS, invasive care and CAD-related deaths were only adjusted for age and sex, not for other risk factors or measures of disease severity; the likelihood of a patient with suspected ACS receiving coronary angiography was based on a relatively small national snapshot audit ($n = 4398$) from 8 years ago;⁷ the timing of invasive care after the ACS event was not provided; and rates of non-invasive co-interventions for ACS were not included in the analysis.

Despite these limitations, some of the key findings are interesting. Rates of angiography and of ACS were only weakly correlated, with no correlation between ACS and PCI rates; these trends were most evident in non-metropolitan areas where CAD mortality was highest. While ACS rates varied 3.7-fold between Medicare Locals, angiography rates varied 5.3-fold. The strongest predictor of angiography being undertaken was admission as a cardiac patient to a private hospital (71 additional angiograms per 1000 admissions), despite lower rates of ACS among private patients, suggesting that many procedures were for non-ACS indications. Coronary revascularisation rates as a proportion of angiography rates varied

between 17% and 61%; higher angiograms rates were associated with reduced likelihood that revascularisation followed. There was a reasonably strong positive association between rates of ACS and CABG, suggesting that less invasive PCI is more vulnerable to unwarranted use. Depressingly, the study also reconfirmed the higher ACS rates in non-metropolitan locations where the prevalence of smoking, obesity and chronic cardiovascular disease is higher.

The disparity between rates of invasive care and those of ACS and overall CAD burden probably means that some patients are receiving interventions they do not need, while, more worryingly, patients who have real need for them are missing out. Without data on clinical indications and criteria of appropriateness for individual patients, overuse cannot be distinguished from underuse. Nevertheless, such variations in invasive care, seemingly unexplained by variations in clinical indications, are of concern, especially as they have been documented since 2005.⁷⁻¹¹

So why is universal access to invasive care according to need seemingly beyond our reach? It is not for want of trying on the part of national professional bodies that develop, disseminate and promote evidence-based recommendations and implementation frameworks.¹² The answer lies with front line health care delivery systems. Cardiology service networks at the state level should collect data on ACS incidence and rates of invasive care in public and private facilities, identify locations where the mismatch is greatest, and seek to understand and mitigate the relevant factors. Networked, hub-and-spoke support systems of rapid diagnostic, referral and transfer procedures are needed, whereby patients with ACS presenting to any emergency centre have rapid access to invasive care in angiography-capable facilities, in accordance with clinical indications and socio-cultural context, and without logistical barriers.^{13,14} Hospitals should report on their provision of appropriate ACS care according to agreed care standards and data collection methods, for benchmarking against peers and sharing improvement strategies.¹⁵

Invasive care prevents about 10% of all CAD-related deaths, whereas medical treatments and reducing risk factors account for at least 80% of saved lives.¹⁶ As Chew and colleagues report, a higher probability of undergoing coronary angiography was associated with only a modest reduction in ACS mortality rates (three fewer deaths per 100 000 population for each 10 percentage point increase in likelihood of angiography). The maximal gain in lives saved after ACS onset will require optimisation of all care modalities along the entire patient trajectory. However, while non-invasive care is not consistently employed across Australia,⁷⁻¹⁰ differences in the use of invasive care are more marked and cannot be allowed to persist into the next decade.

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- 1 Australian Institute of Health and Welfare. Australia's health 2014 (AIHW Cat. No. AUS 178; Australia's Health Series No. 14). Canberra: AIHW, 2014. <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129548150> (accessed May 2016).
- 2 Keeley EC, Boura JA, Grines CL. Primary angioplasty versus intravenous thrombolytic therapy for acute myocardial infarction: a quantitative review of 23 randomised trials. *Lancet* 2003; 361: 13-20.
- 3 Hoeng MR, Aroney CN, Scott IA. Early invasive versus conservative strategies for unstable angina and non-ST elevation myocardial infarction in the stent era. *Cochrane Database Syst Rev* 2010; (3): CD004815.
- 4 Fox KA, Clayton TC, Damman P, et al. Long-term outcome of a routine versus selective invasive strategy in patients with non-ST-segment elevation acute coronary syndrome: a meta-analysis of individual patient data. *J Am Coll Cardiol* 2010; 55: 2435-2445.
- 5 Stergiopoulos K, Boden WE, Hartigan P, et al. Percutaneous coronary intervention outcomes in patients with stable obstructive coronary artery disease and myocardial ischemia: a collaborative meta-analysis of contemporary randomized clinical trials. *JAMA Intern Med* 2014; 174: 232-240.
- 6 Chew DP, MacIsaac AI, Lefkowitz J, et al. Variation in coronary angiography rates in Australia: correlations with socio-demographic, health service and disease burden indices. *Med J Aust* 2016; 205: 114-120.
- 7 Chew DP, French J, Briffa TG, et al. Acute coronary syndrome care across Australia and New Zealand: the SNAPSHOT ACS study. *Med J Aust* 2013; 199: 185-191. <https://www.mja.com.au/journal/2013/199/3/acute-coronary-syndrome-care-across-australia-and-new-zealand-snapshot-acs-study>
- 8 Scott IA, Duke AB, Darwin IC, et al; for the CHI Cardiac Collaborative. Variations in indicated care of patients with acute coronary syndromes in Queensland hospitals. *Med J Aust* 2005; 182: 325-330. <https://www.mja.com.au/journal/2005/182/7/variations-indicated-care-patients-acute-coronary-syndromes-queensland-hospitals>
- 9 Scott IA, Derhy PH, O'Kane D, et al. Discordance between level of risk and intensity of evidence-based treatment in patients with acute coronary syndromes. *Med J Aust* 2007; 187: 153-159. <https://www.mja.com.au/journal/2007/187/3/discordance-between-level-risk-and-intensity-evidence-based-treatment-patients>
- 10 Walters DL, Aroney CN, Chew DP, et al. Variations in the application of cardiac care in Australia. *Med J Aust* 2008; 188: 218-223. <https://www.mja.com.au/journal/2008/188/4/variations-application-cardiac-care-australia>
- 11 Chew DP, Amerena JV, Coverdale SG, et al. Invasive management and late clinical outcomes in contemporary Australian management of acute coronary syndromes: observations from the ACACIA registry. *Med J Aust* 2008; 188: 691-697. <https://www.mja.com.au/journal/2008/188/12/invasive-management-and-late-clinical-outcomes-contemporary-australian>
- 12 Brieger D, Kelly AM, Aroney C, et al. Acute coronary syndromes: consensus recommendations for translating knowledge into action. *Med J Aust* 2009; 191: 334-338. <https://www.mja.com.au/journal/2009/191/6/acute-coronary-syndromes-consensus-recommendations-translating-knowledge-action>
- 13 Tideman PA, Tirimacco R, Senior DP, et al. Impact of a regionalised clinical cardiac support network on mortality among rural patients with myocardial infarction. *Med J Aust* 2014; 200: 157-160. <https://www.mja.com.au/journal/2014/200/3/impact-regionalised-clinical-cardiac-support-network-mortality-among-rural>
- 14 Ilton MK, Walsh WF, Brown AD, et al. A framework for overcoming disparities in management of acute coronary syndromes in the Australian Aboriginal and Torres Strait Islander population. A consensus statement from the National Heart Foundation of Australia. *Med J Aust* 2014; 200: 639-643. <https://www.mja.com.au/journal/2014/200/11/framework-overcoming-disparities-management-acute-coronary-syndromes-australian>
- 15 Scott IA, Denaro CP, Bennett CJ, et al; for the Brisbane Cardiac Consortium Leadership Group. Achieving better in-hospital and after-hospital care of patients with acute cardiac disease. *Med J Aust* 2004; 180 (Suppl 10): S83-S88. <https://www.mja.com.au/journal/2004/180/10/achieving-better-hospital-and-after-hospital-care-patients-acute-cardiac-disease>
- 16 Ford ES, Ajani UA, Croft JB, et al. Explaining the decrease in US deaths from coronary disease, 1980–2000. *N Engl J Med* 2007; 356: 2388-2398. ■