

Reducing Low-Value Tests in the Barwon Health Emergency Department

Hospital or health system name:

University Hospital Geelong, Victoria, Australia

Demographic information

Barwon Health services a population of 350,000 in and around Geelong, Victoria, extending to 500,000 for some tertiary services offered across the wider Barwon South West region. The catchment also has around seven million visitors each year that impact on service demand. Peak traffic flows at weekends are an unusual characteristic compared with other areas.

Barwon Health serves a geographically dispersed population with 1016 beds at two major sites and a total of 21 sites overall, stretching down the coast to Anglesea, Torquay and Lorne.

Barwon Health provides the full spectrum of health care from emergency and acute to mental health, primary care, community services, aged care and subacute/rehabilitation.

Specialist services extend north to Werribee and south to the South Australian border for major specialties such as cancer, cardiology and cardio-thoracic surgery. With the exception of neurosurgery and transplantation, virtually all other specialties are available in Geelong.

GGHH agenda goals

- Leadership
- Energy

Case study summary

Barwon Health reduced selected low value tests in the Emergency Department (ED) in Geelong, Australia by between 40 and 50% per year. Annual savings were estimated at \$885,000 for pathology costs, 726 hours of staff time and 906 kg of CO₂-e emissions, with no adverse patient impacts identified.

The issue

Choosing Wisely Australia is an initiative of NPS MedicineWise that is driving reductions in unnecessary, low-value and sometimes harmful care in Australia. According to Choosing Wisely, 25–75% of tests in Australian primary care are not supported by evidence or expert opinion and there is inappropriate use of many common tests. Further, it is estimated that there is an average level of waste of between 15% and 20% of total health care expenditure across all OECD nations including Australia (OECD, 2017). Apart from the financial costs to the health service, consequences to the patient of unnecessary or harmful testing and interventions can include pain, injury, anxiety, additional medical costs, travel costs and lost wages.

Hospital goals

The initiative addressed a number of Barwon Health's strategic goals:

- Financial sustainability - We live within our means and we grow our capacity.
- Environmental sustainability - We aim to achieve net zero emissions by 2045 to reduce the impact of climate change on the health of our community.
- We aim always to improve the value of our services.
- We apply evidence to improve care.
- Right care, right time, right place, right way.

Sustainability strategy implemented

At the Barwon Health Emergency Department in Geelong, Victoria, the Choosing Wisely initiative inspired a drive for change, encouraged by successful work done elsewhere across Victoria particularly by Eastern Health. A multi-disciplinary group of Barwon Health emergency department staff has initiated a "No Unhelpful Tests" (NUT) committee to help reduce the expanding number of low-value tests being ordered in the emergency department. The NUT committee's goal is to promote evidence-based use of ED investigations and to help deliver the right amount of care for Barwon Health consumers.

Implementation process

In October 2023, the NUT team rolled out their first project, targeting the use of the most labour-intensive, frequent and expensive tests, including rapid COVID-19 'Qiagen' PCR, venous blood gases (VBGs) and coagulation tests.

First clear test indication guidelines were established, drawing from local data as well as international evidence.

Then the team canvassed emergency staff to identify the behavioural drivers that were leading to overuse of specific tests. Using the COM-B model (Capability, Opportunity and Motivation Behavioural Model) interventions were matched to behavioural drivers, thereby optimising the intervention impact. In one instance it was found to be effective to move the VBG test kits to a single centralised store room instead of being dispersed in trolleys around the department.

Then an education program was implemented. This involved displaying posters around the emergency department, developing specialised request forms and altering the locations of tests to optimise the necessary use of the tests. The posters are attached (Appendix 1-3).

The project was rolled out over a period of approximately six months. Changes to the individual testing regimes were staggered, with results on individual tests obvious within two months.

Tracking progress

The project has yielded early success. Qiagen ordering has decreased by 41%, VBG ordering by 53% and Coagulation tests by 48%, saving an estimated \$885,000 per year in pathology costs and 726 hours per year of staff time with no adverse effects identified.

These impressive results occurred whilst an increase in COVID-19 was identified in ED compared to the pre-intervention period and with a similar number of patients presenting to ED.

Progress achieved

Environmental

- Ordering of COVID-19 PCR tests was decreased by 41%, VBG (venous blood gases) by 53% and coagulation tests by 48%.
- Estimated carbon emissions:
 - Qiagen COVID-19 PCR tests – avoided 125 kg CO₂-e per year based on 25.5 grams CO₂-e per test (Richardson, 2020)
 - Venous blood gas tests – avoided 469 kg CO₂-e per year based on 49 grams CO₂-e per test (McAlister et al, 2020)
 - Coagulation tests – avoided 312 kg CO₂-e per year based on 82 grams CO₂-e per test (McAlister et al 2020)
 - Total reduction in emissions was estimated to be 906 kg CO₂-e per year.

Financial

- Annual savings from the reduced number of tests were estimated to be around \$885,000 (based on test numbers in April 2023 compared to April 2024).
- Staff time for testing was reduced by around 726 hours per year, or around 91 eight-hour shifts. Assuming an average hourly rate of \$50 this added a further \$36,000 to the annual financial savings.

Patient Care

- No adverse events were identified.
- The time saved allowed additional patients to be treated and provided the nursing students involved with time to carry out other quality improvement tasks which led to better running of the department.
- Further patient benefits included a reduction in discomfort to patients, especially children, from nose swabs and in some instances, earlier release from the ED.

Please note that the information in this case study was provided by the GGHH member named above. Health Care Without Harm (HCWH) is not responsible for the accuracy of the information/data provided.

Challenges and lessons learned

Project lead and Barwon Health ED consultant Dr Mark Henderson noted that patient safety was paramount at all times.

Regarding the VBG tests, liaising with key staff who work on sepsis identification was vital, as was engaging the Barwon Health Safety and Quality Lead to ensure no adverse effects were observed. Monitoring the serum lactate level was performed instead of VBG on some patients, which is cheaper, less time consuming and more specific to the clinical question.

Regarding the Qiagen tests he said that it had been critical to ensure criteria were endorsed by Infection Prevention and Public Health leadership as well as by ED leadership.

On the coagulation tests, achieving consensus among many specialty directorates was vital to ensure consistent practice across all patient groups and to avoid on-floor friction around indications for tests. These included Haematology, Gastroenterology, Surgery, Orthopaedics, Anaesthetics, Respiratory as well as Emergency.

Dr Henderson noted that changing staff habits was a key element of the project. One intervention (moving the VBG sampling equipment) was viewed as disempowering for some staff. This likely came from a difficulty in reaching certain staff groups effectively and simultaneously, given the number of staff involved from different levels, craft groups and EFT fractions. This issue was disentangled by enlisting the help of the various craft groups' existing education leaders to disseminate the true intent and methodology of the program. Dr Henderson said the project's success was attributable to the enduring flexibility and openness to change among ED staff.

"The challenge now will be to sustain this change as we look to many more projects in the coming year", he said.

Next steps

The NUT committee will next focus its work on unhelpful troponin ordering, ECGs, Chest Xrays, delirium screens, and various CT modalities in collaboration with medical, surgical and cardiology inpatient teams.


Links

- Choosing Wisely Australia <https://www.choosingwisely.org.au/>
- McAlister, S, Barratt, A, Bell, K and McGain, F (2020) The carbon footprint of pathology testing - Medical Journal of Australia Medical Journal of Australia: Volume 212, Issue 8, pp 377-382. <https://www.mja.com.au/journal/2020/212/8/carbon-footprint-pathology-testing>
- OECD, 2017 https://read.oecd-ilibrary.org/social-issues-migration-health/tackling-wasteful-spending-on-health_9789264266414-en#page4
- Richardson, D (2020) Environmental Impact of COVID Testing from Plastic and CO2 <https://www.linkedin.com/pulse/environmental-impact-covid-testing-from-plastic-co2-david-richardson/>

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Appendix 1 – Poster VBG Criteria

VBG CRITERIA for E.D.



1. Critically unwell patients
2. DKA
3. SEVERE SEPSIS
4. Respiratory failure
5. Significant overdose
6. Potassium level required immediately
7. Suspected ischaemic gut
8. As requested by ED consultant

**99% OF PATIENTS WHO BENEFIT FROM A VBG
WILL FIT ONE OR MORE OF THESE CRITERIA!***

*Recent ED audit of 340 VBGs NUT COMMITTEE

Appendix 2 – Poster COAGS Criteria

Indications for COAGs

Indicated

COAG for:

- Personal/family HX unexplained bleeding/bruising/petechiae
- Major trauma
- Major transfusion
- Suspected DIC including:
 - Severe sepsis
 - Cardiac arrest
- Stroke thrombolysis
- Snakebite
- Hypothermia (<33 degrees)

Partial order indicated

INR for:

- Warfarin monitoring
- Paracetamol tox (limited circumstances)
- Pre-thrombolysis (P.E./limb ischaemia)

INR + Fibrinogen:

- Liver cirrhosis and haemorrhage

APPT for:


- Heparin monitoring

Thrombin time:

- Dabigatran and life threat (e.g ICH)

Not routinely indicated

- Non-major trauma
- Non-major transfusion bleeding
- Sepsis without suspected DIC
- DOAC monitoring (even if bleed)
- Peri-procedure/OP patients
- Pre-commencement or anti-coagulation
- Chest pain or abdominal pain
- Non-thrombolysis pathway stroke



Reviewed and endorsed by leadership

- Surgical unit
- Gastroenterology
- Orthopaedics
- Respiratory
- Anaesthetics
- Haematology
- Emergency

Recent audit of our practice

- 80% of coagulation studies are not indicated
- \$30 per COAG study
- \$10 per INR or APTT

Practice point

- Lab holds and processes blue top tubes without placing a request on the form
- Requesting COAG on the initial slip order in case you want D-Dimer later is not required

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Appendix 3 – Poster QIAGEN Criteria

Your patient may not need a QIAGEN...

The infographic shows three rows of criteria:

- Row 1: SYMPTOMS + RISK FACTORS FOR SEVERE COVID = QIAGEN (if not known on RAT)
- Row 2: SYMPTOMS + ADMIT (WARD OR SHARED SSU) = QIAGEN
- Row 3: NO SYMPTOMS + ADMIT (WARD OR SHARED SSU) = RAT

40% of QIAGEN performed during recent audit **do not meet** these criteria.

Together we could...

- Save up to \$800K/ year
- Spend this time providing other care/symptom control
- Reduce false exclusion of bacterial illness in unwell patients

NUT COMMITTEE

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