

What Have We Learned and Where

The Inaugural NICS - RANZCR Fellowships

In 2006, the College Council decided to partner with the National Institute of Clinical Studies (NICS) in funding two 2-year Fellowships in evidence implementation. The Fellowships were intended to support the professional development of radiologists wishing to improve their knowledge and skills in professional change management and implementation of evidence based practice in diagnostic imaging. In supporting these Fellowships, RANZCR became the first medical College in Australia to take this step.



Dr Taryn Bessen

What Are NICS Fellowships?

The National Health and Medical Research Council (NHMRC's) NICS Fellowships are part of the NICS Leadership Program and were first offered in 2003 to identify and support future leaders in the science and practice of evidence implementation. These prestigious awards are acknowledged for their contribution to building a community of practitioners within Australia who have the expertise to support other health professionals in overcoming the barriers to applying research evidence.

Supporting Future Leaders

The NICS Fellowships offer a unique, two-year half-time program for early-to-mid career professionals who are future leaders in health care.

Building on the best available evidence from quality research, NICS Fellows identify an important gap where high quality evidence already exists but is not being applied in routine care. They design and execute an implementation project aimed at increasing the uptake of this evidence within their particular health care setting to improve health outcomes for patients.

As well as providing an annual stipend of up to \$60,000, each Fellowship includes ongoing professional development and training. The NICS Visiting Experts initiative plays an integral part by inviting leaders in implementation science for masterclasses and lectures, giving NICS Fellows unparalleled networking opportunities and access to high profile national and international health experts. It costs NICS an additional \$40,000 per Fellow to provide this educational program.

Mentoring is another vital component of the program. For each Fellow, NICS appoints a mentor, typically a senior figure in Australian health care who can provide expert advice, support and guidance on career development and leadership. In turn, graduating Fellows themselves become mentors, ensuring an ever growing knowledge base and cohort of experts in evidence implementation.

The NICS – RANZCR Fellowship Experience

Dr Taryn Bessen, Department of Radiology, Royal Adelaide Hospital, and I were the inaugural Fellows. We have both found the Fellowships to be one of the very best professional experiences of our careers and the support and training offered by NICS and RANZCR has been fantastic.

I had very little experience, all of learned by trial and error, in trying to implement change in clinical practice where there were obvious gaps between what the evidence told us and what we were actually doing in our daily practice.

I chose to work with the three emergency departments (ED) of *Southern Health* to implement validated decision tools for use

To Now?

in patients with suspected venous thromboembolism, either DVT or pulmonary embolism. Our aim was to ensure that all patients referred for imaging from the ED's with either of these conditions were appropriately referred, in other words that their pre test probability was not so low that they should have VTE excluded in the first instance by the performance of a D-dimer assay. In our hospitals, this test costs about \$A20 and takes an hour to turn around. Its sensitivity is approximately 85-90% for VTE and is the test of choice for emergency patients with suspected VTE and low pre test likelihood of VTE. If negative, in the setting of low pre test likelihood, post test likelihood of VTE is sufficiently low that imaging is not required. Approximately 1/3 of unselected outpatients presenting with suspicion of VTE will be in this category and thus will not need imaging. This has the potential to reduce radiation exposure, costs related to waiting times in the ED and imaging, and risk for individual medical practitioners and the organisation.

The critical steps in the implementation were:

- To make key ED physicians aware of the gap between what was being done (i.e. no routine risk assessment of patients referred for imaging) and what the literature i.e. evidence from high quality systematic reviews (1,2) said we should be doing.
- To gain their "in principle" support for changes to practice.
- To use externally validated decision tools, about whose quality or clinical applicability there was no argument, to help clinicians standardise their risk assessment of patients with VTE. This was key to ensuring that the "right" patients were being referred for imaging as it has been shown that individual clinical judgements about risk often vary markedly from clinician to clinician, even when these clinicians are experienced (3,4).
- These validated tools were incorporated into a request form that was specific for PE or DVT. It was A4 sized and coloured and looked nothing like the "ordinary" request slip. There is evidence that even experienced clinicians cannot recall important elements of decision tools of which they are well aware and this results in default use of subjective

clinical judgement in a high proportion of cases (5).

- Recommendations were also made regarding the appropriateness of CTPA compared with VQ in patients with clear chest radiography and no recent smoking history, especially young women, because of the higher lung and breast radiation dose delivered by CTPA compared with VQ and the higher likelihood of a non-indeterminate VQ result in this subgroup.
- Pregnant women were specifically excluded from application of the decision tools as they were not included in the population in whom the tools were originally developed.
- Potential barriers at organisational, departmental, social, professional and patient levels were considered and some proposed mechanisms to overcome these were devised and the extensive literature on this topic was reviewed in order to gain a theoretical, if not practical, understanding of how to approach change management in healthcare



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(6-12). However, it became apparent as time went on that many of the anticipated barriers did not eventuate and others we had not considered became important. Flexibility and the capacity to recognise and respond to these obstacles in a short time frame was crucial to success.

- The forms were trialled in the EDs and re-designed twice to make them less ambiguous and easier to use, at the request of the ED physicians.
- Medical Imaging Technologists (MITs) in CT, Ultrasound, and Nuclear Medicine acted as gatekeepers who rejected inappropriate request forms.
- Monthly audit of compliance with request form use and “appropriateness” of referral, according to the clinical details provided and D dimer level.
- Monthly feedback (via email) to MITs and key ED physicians occurred.
- Jars of lollies in CT, US, and Nuclear Medicine Departments reminding staff about the importance of appropriate requests.
- Reject requests were collected and requests were STILL being rejected at the end of the 2 year implementation period, so the need for vigilance never ceased. However, it became accepted practice and “habit” for MITs to do this after about 18 months of positive reinforcement by Chief MITs and myself.

Barriers to implementation included:

- Culture of MITs accepting all requests from ED needed to be challenged and was initially difficult to change but strong support of Chief MITs, whose status and knowledge was respected by their colleagues, helped a great deal. Consistent back up by radiologists was essential when they were challenged by ED medical staff.
- High staff turnover and highly variable levels of experience in the EDs meant that an education program alone was impossible to deliver on an ongoing basis so high level buy-in by ED medical staff and gatekeeping by MITs, radiologists, and radiology registrars on a daily basis was critical throughout the life of the project and this requires cultural change that acknowledges that this approach is permanent and not a “project”.
- The financial support provided by the Fellowship made it possible to do academic detailing and audit. This would have been impossible otherwise as this type of activity receives no significant financial support at our institution.

Results

An audit was conducted over the entire two year implementation period. Request forms for imaging were hand-checked on 7-8 randomly selected days per month (not known to ED medical staff or MITs, with days including weekend and public holiday days).

Request forms were checked for:

1. Use of the appropriate form
2. Completion of risk assessment
3. Decision to perform imaging appropriate to the presented clinical information

As can be seen from the charts below, high compliance with the fundamental requirement of this implementation project has been achieved, and that is to mandate documentation of structured risk assessment of patients with suspected VTE prior to imaging.

The second measure of compliance was the frequency of imaging in patients with negative D dimer or no D dimer performed and low pre test risk. A random audit was performed between March 2006 and August 2007 to assess this and the results were as follows:

- Of 102 patients who had VQ imaging, 7 had low risk and no (2) or normal (5) D dimer. Thus the evidence based recommendation to not image patients with low risk and negative D dimer was adhered to in 94% of patients.
- Of 258 patients who had CTPA, 9 had low risk and no (6) or normal (3) D dimer consistent with 97% compliance with the recommendation.
- Of 123 patients who had Ultrasound, 2 had low risk and no D dimer performed, indicating 98% compliance.

For the period March to August, a comparison between 2006 and 2007 is provided in the table below:

	2006	2007
VQ	21	34
CTPA	85	78
Total PE imaging studies	106	112
LLUS	41	57

It is evident that imaging volumes for patients with suspected PE have increased 5% while ultrasound volumes have increased 39% (Table 1, below). While it was not the goal of this project to necessarily reduce the volume of imaging performed, but rather to increase the appropriateness of the imaging that was performed, a substantial increase in the amount of imaging was not an expected outcome.

Possible reasons for this increase could include

- more ED patients
- more ED patients with possible VTE (both of which would result in appropriate increase in referral rate)
- inappropriate referral for imaging due to misapplication of the decision tool.

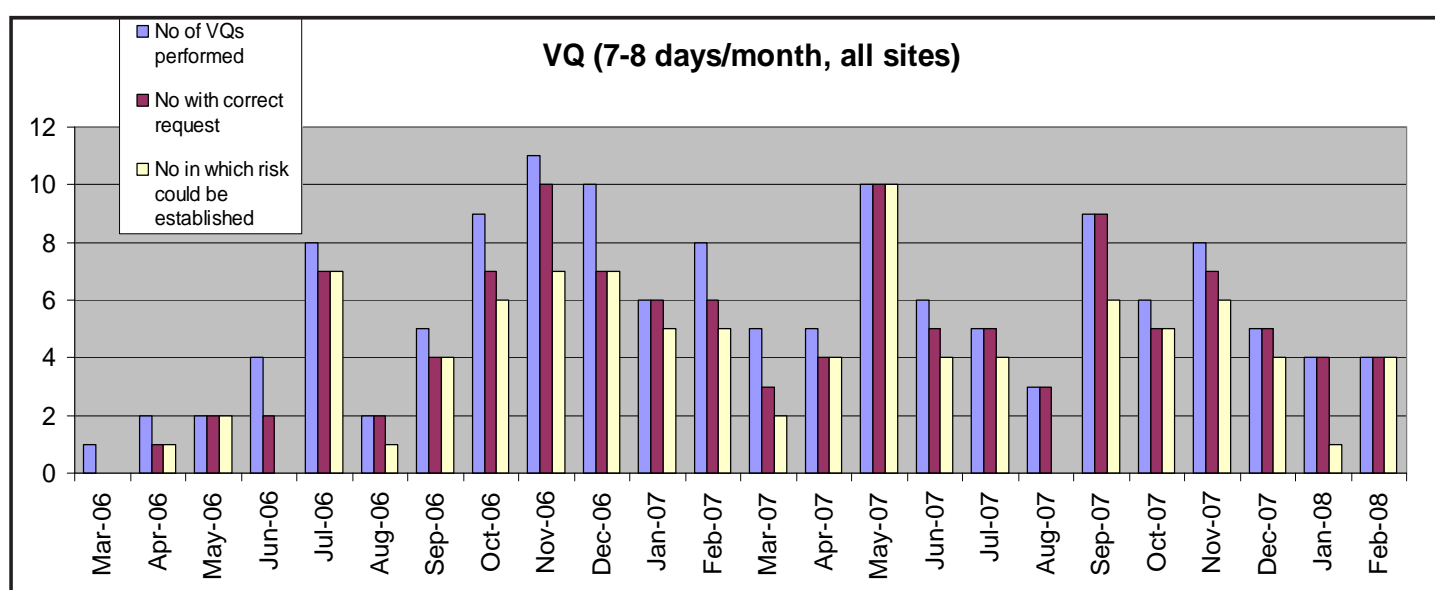
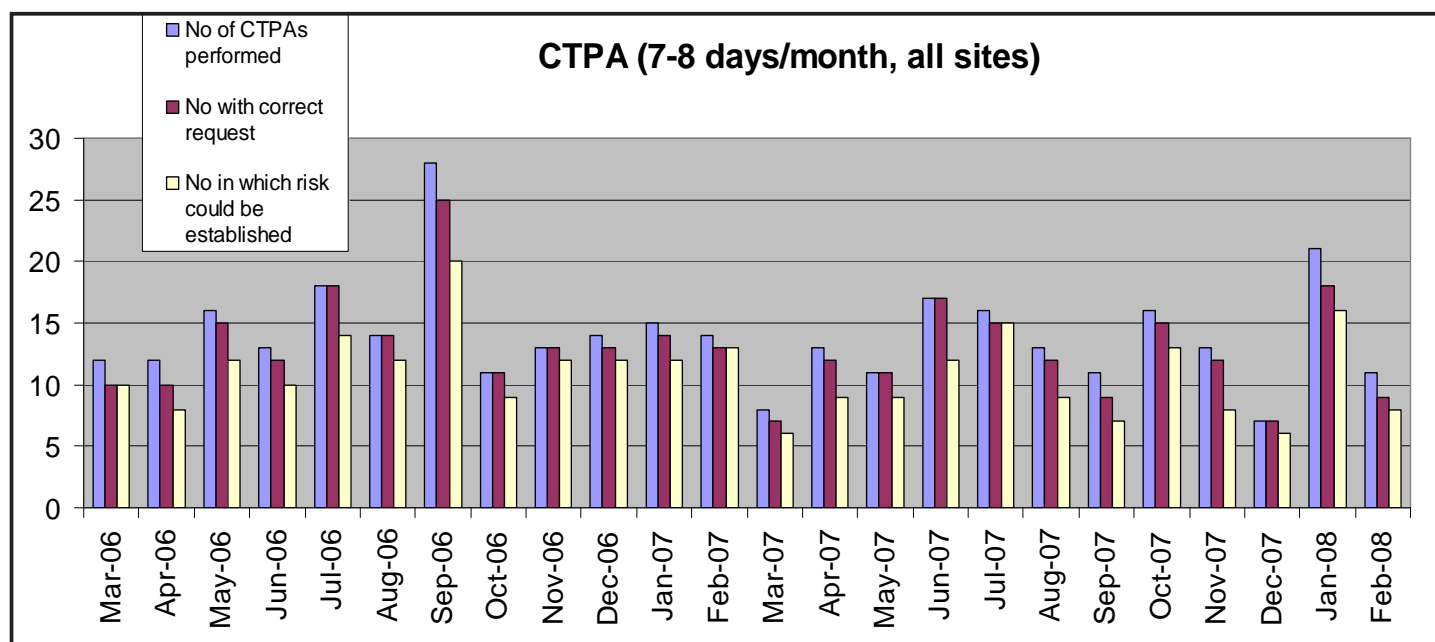
For the period March to May 2006, 31 281 patients presented to the EDs at *Southern Health* and for March to May 2007 this figure increased 10% to 34 403. If the number of patients

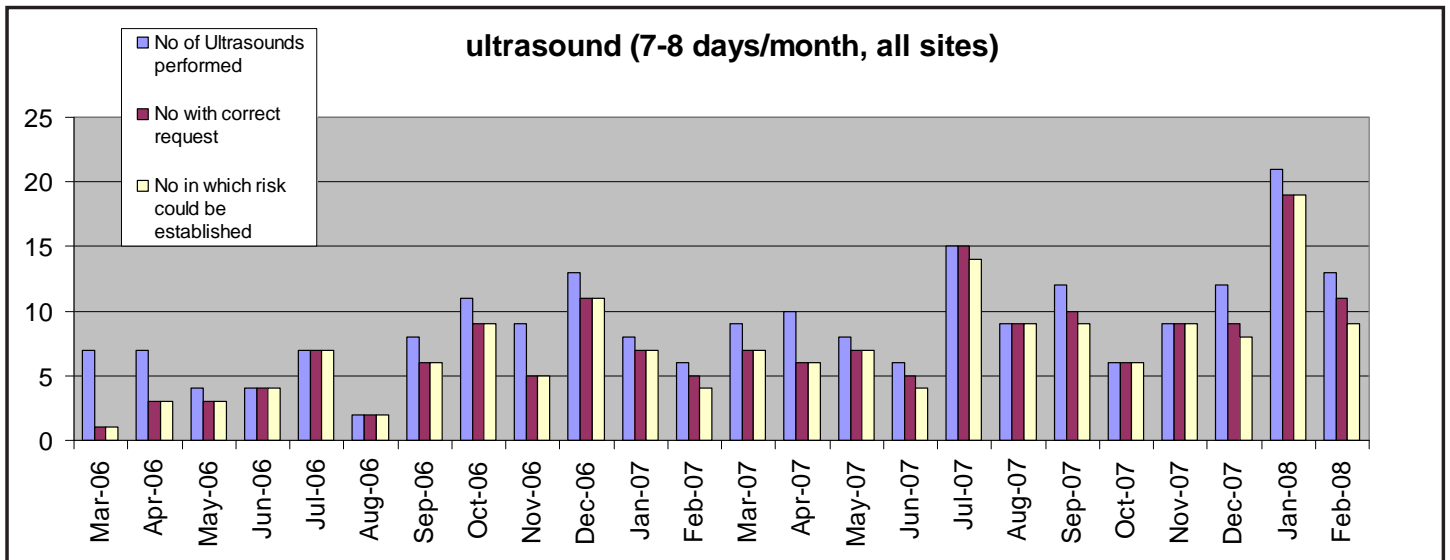
receiving PE and DVT imaging in the March to August audit period for 2006 and 2007 is adjusted for this increase in throughput, it can be seen that 0.34% of patients in 2006 and 0.33% of patients in 2007 received PE imaging (a relative reduction of 3%) and 0.13% had LLUS in 2006 compared with 0.17%, a 30% relative increase.

In terms of acuity, patients in the top three categories (Resuscitation, Emergency, and Urgent) increased from 14 165 to 16 895 (a 19.2% increase) for the four month period March to June 2006 compared with the same period in 2007. It is expected that patients with suspected PE would be in one of these top three categories in most cases. This allows further refinement of our estimate of the real reduction in imaging performed on the "at risk" group: 0.75% of the patients in the top three acuity categories received imaging in the audited months in 2006 whereas 0.66% received it in 2007, a relative reduction of 12%. This is in sharp contrast to the growth in imaging billed to Medicare, which was 5.3% for ultrasound

and 8.5% for CT scanning for the 06-07 financial year as of October 2006 (Source: Health Insurance Commission and Medicare Australia).

It is uncertain whether a patient with isolated symptoms or signs of DVT without any suggestion of associate PE would be categorised as belonging to one of the top three or the lower two categories of acuity. There was effectively no change in the number of patients presenting in this group (17 116 in 2006 and 17 507 in 2007) for the 4 audited months. Hence, if patients with suspected DVT belonged to one of these categories, there is no explanation for increased imaging based solely on an increased number of patients presenting to the ED. If they belonged to one of the top three categories, 0.29% had imaging for DVT in 2006 whereas 0.34% had DVT imaging in 2007, a relative increase of 17%. We are currently investigating the prevalence of positive ultrasound results for the two periods as a surrogate way of determining if these increased referrals could have been "appropriate".





Conclusion: Lessons Learned from the NICS-RANZCR Fellowship

Bringing about culture change and particularly change to work practices in the healthcare system requires active support and participation from those in positions of power and influence amongst the group(s) you wish to change. Without this, change is almost impossible. When it is absent, background work needs to be done on the reasons for the lack of support or willingness to change before implementation can be contemplated. The catch phrase "it's not about you!" became the motto of the NICS Fellows as we experienced first hand how difficult implementation of evidence based practice really is. However, persistence is key.

Practice setting has a huge impact on the success or failure of implementation; one size definitely does not fit all if an implementation program is transported from one place to another. Culture, economic imperatives (e.g. is there a financial penalty or saving for not doing an imaging test) and clinician behaviour and knowledge will all strongly influence whether or not methods are transferable. Primary care physicians, who value their autonomy and independence, cannot be expected to respond in the same manner as emergency physicians, who may regard themselves more as part of a large team.

I have found it challenging but very worthwhile and satisfying to work across disciplines on this project and I have learned a great deal from clinical colleagues. We have successfully implemented standardised approaches to imaging in a number of clinical situations that are common in our emergency departments with the active participation and support of our clinical colleagues. These decision supports, as well as those used for this project can be found at www.southernhealth.org.au/imaging.

The QUDI Program will shortly announce the successful candidate for the new NICS-RANZCR-NBOCC Fellowship. This fellowship will focus on the use of the NBCC Synoptic breast imaging report. This new fellowship is co-sponsored by the College (with funding from QUDI) and the National Breast and Ovarian Cancer Centre and will be supported by the employing practice of the new fellowship recipient.

The NICS-RANZCR Fellowships represent a very significant way that we can support the next generation of radiologists to become active participants in decisions about how we deliver care to patients. Development of these skills is vital if we are to retain our status as clinicians and valued members of a clinical team.

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