9 International evidence for nurse endoscopy: literature review

In 2009, the NBCS program quality working group published a report [32] outlining strategies to improve colonoscopy services in Australia. The issue confronted by the group was the expansion of demand with current and future workforce capacity. It was predicted that medical graduates would be insufficient to meet future colonoscopy demand. A key consideration in this report was the introduction of specialist nurses trained to perform colonoscopies and sigmoidoscopies.

Internationally there has also been growing interest in the development of nurse endoscopy to address similar concerns over demand, capacity and efficiency. As such, there is a growing body of literature about this model of service delivery. This evidence will be presented as a means to mitigate a number of concerns raised over the introduction of nurse endoscopy in Queensland. A full bibliography is appended as Appendix 4 and a sample of some of the representative documents demonstrating that the utilisation of nurses for endoscopy services is a safe and effective strategy is summarised below.

9.1 Scope of current roles and practice in nurse endoscopy

Endoscopy performed by nurses or technicians occurs in various parts of the world. In the United Kingdom, registered nurses have been performing endoscopy since the mid–1990s [32]. Nurse endoscopists undertake diagnostic and therapeutic flexible sigmoidoscopy, diagnostic and therapeutic colonoscopy and upper GI endoscopy [33].

In a report by Douglas [34], the workload of nurse endoscopists was between 11–13 flexible sigmoidoscopies and between four and eight colonoscopies per week. The MINuET [27] researchers considered the workforce implications of nurse endoscopy and suggested that two FTE nurse endoscopists could undertake approximately 2500 upper GI endoscopies and 500 flexible sigmoidoscopies per annum.

9.2 Quality and safety

A significant number of studies were identified relating the roles and competencies of nurses undertaking endoscopy. The available evidence suggests that appropriately trained nurses can perform diagnostic endoscopy safely and with similar outcomes to doctors.

9.2.1 Systematic reviews

A systematic review in 2007 by Versruur et. Al. [35] of three randomised trials comparing nurses with doctors or medical trainees for flexible sigmoidoscopy and upper endoscopy found that there was no difference in performance and accuracy of the procedure between doctors and nurses.

A further 14 non-randomised studies evaluated nurses’ performance in:

- upper endoscopy (two studies)
- endoscopic ultrasound (one study)
- flexible sigmoidoscopy (seven studies)
• capsule endoscopy (two studies) and
• percutaneous endoscopic gastrostomy placement (two studies).

Overall, the authors concluded that nurses were able to perform all these procedures safely and accurately.

9.2.2 The MINuET trial [36]

The objective was to compare endoscopy (diagnostic upper GI endoscopy or flexible sigmoidoscopy) carried out by nurses and the resulting sequence of events with endoscopy carried out by doctors and its sequelae. The trial was performed in 23 hospitals in the United Kingdom and was a pragmatic trial with endoscopy being performed according to the standard protocols of the participating hospitals. Outcomes were evaluated one day, one month and one year after the procedure. The primary outcome was the score on a gastrointestinal symptom rating questionnaire one year after endoscopy.

Of 4964 potentially eligible patients, 4128 were randomised and 1888 were recruited into the trial. They were treated by 67 doctors and 30 nurses. There were no statistically significant differences between groups in outcomes except that patients were more satisfied with nurses at one day after endoscopy. Nurses were significantly more thorough than doctors in examining the stomach and oesophagus. Quality of life scores were slightly higher in the doctor group but the difference was not statistically significant. The authors’ main conclusion was that diagnostic endoscopy can be undertaken safely and effectively by nurses.

9.2.3 Multicentre prospective cohort studies

Two studies have been undertaken in the Netherlands to evaluate the quality and safety of colonoscopies performed by nurse endoscopists.

In the first study, colonoscopies were performed for screening or surveillance in 42% of cases and for symptomatic indications in 58% of cases. The unassisted cecal intubation rate was 94%—the mean withdrawal time was 10±5 minutes. The adenoma detection rate was 26.7 %. In 229 of the colonoscopies (23 %), the nurse endoscopists required assistance from the supervising gastroenterologist. The complication rate was 0.2 %—one perforation and one cardiopulmonary complication. The study concluded that nurse endoscopists performed colonoscopies according to the internationally recognised quality standards [37].

In the second study the endoscopic quality and safety were comparable between nurse and physician trainees. Overall, rates of cecal intubation were 95% for nurses and 93% for physicians, including procedures that required assistance from a supervisor—mean withdrawal times were 10.4 and 9.8 minutes, respectively. Each group detected 27% of adenomas and had a 0.5% rate of complication. In both groups, the rates of unassisted cecal intubation gradually increased with the number of colonoscopies performed, from 70% for nurses and 74% for physicians at the beginning to 89% and 86%, respectively, at the end of the assessment period. The study concluded that in a supervised setting, nurse endoscopists perform colonoscopies according to quality and safety standards that are comparable with those of physician endoscopists [38].
9.3 Education and training

Literature [33, 37, 38] suggests nurses performing endoscopy should have completed their training to a standard set of appropriate and approved guidelines. Woods et al [33] recommend that education qualifications from a university support clinical work and patient management.

While early training in the United Kingdom recommended that nurses first undertake training in flexible sigmoidoscopy prior to colonoscopy, more recent literature states that no prior experience is required to undertake colonoscopy training [38].

Massl et al [38] states that the quality and safety of training of nurse endoscopists is comparable to physician trainees.

9.4 Cost effectiveness

There are three potentially relevant economic evaluations that have been able to be found. These include:

1. The MINuET Economic Evaluation [27] was based over a one-year horizon conducted from the perspective of the NHS. This evaluation was based on quality-adjusted life years (QALYs) from a baseline to one year after endoscopy. Patients who had the procedure performed by doctors had slightly higher QALYs than nurses. This result was attributed to a higher number of additional tests and investigations in the nurses’ group. The authors concluded that endoscopies carried out by doctors were slightly more expensive, but were more cost effective than those carried out by nurses. There is considerable uncertainty surrounding the economic findings. In addition, any loss of cost-effectiveness resulting from a transfer of elective endoscopy from doctors to nurses needs to be balanced against possible gains from using the doctors more effectively elsewhere. The influence of any of these factors on any decisions relating to service provision was outside the scope of the MINuET study.

2. A study by Verschuur et al [35] regarding screening for CRC with flexible sigmoidoscopy by non-physicians concluded that endoscopies performed by nurses tend to be less expensive than those performed by doctors.

3. A study conducted by Massl et al [38] concluded around 15% reduction in personnel costs associated with nurse endoscopists performing colonoscopy.

9.5 Patient satisfaction

Studies identified [27, 39, 40] a high patient satisfaction rate with nurses performing endoscopy. In van Putten et al [37], a questionnaire was completed by 734/1000 patients (73%). Patients (95%) were satisfied with the endoscopic procedure, 72% had no preference for a physician or nurse endoscopist, 15% preferred a physician and 12% preferred a nurse. In conclusion, there was a high-level of satisfaction with nurse endoscopists.
9.6 Implications

The overwhelming evidence reviewed to date indicates that nurse endoscopy is safe and can be used to augment gastroenterology services. The level and mix of staff employed in a hospital will be core determinant of the cost and quality of care delivered. The literature review has revealed considerable scope for skill mix change, including role design, such as substitution of doctors by nurses. As the MINuET (pg. 55) [27] study states, research evidence ‘can and should be influencing workforce policy’.

There are a number of reasons for health managers and policy-makers to consider appropriate skill mix in hospitals and a number of factors that drive change in the skill mix of healthcare delivery. The drivers for nurse endoscopy include:

- staff shortages in the medical workforce
- increasing demand for diagnostic and therapeutic services
- inappropriate use of skills, particularly underutilisation of specialist gastroenterology nurses, and
- cost, particularly in services where staffing costs are responsible for the most of the overall expenditure.
10 Introducing nurse endoscopists in Queensland

10.1 Nurse endoscopy workforce projections

Use of nurse endoscopy is a newly emerging trend across numerous countries. As such, there was no evidence to assist in workforce planning. At this stage it is difficult to assess the numbers that are required in Queensland Health and this will be determined largely on the models of care proposed by the HHSs and the private sector.

10.2 Nurse endoscopy and Hospital and Health Service readiness

It should be recognised that nurse endoscopists are not sole practitioners working in isolation. They work within multidisciplinary teams with the support of gastroenterologists. It is also recommended that appropriate level surgical support remains available in the unlikely event of complications.

In regards to organisational readiness for the training of nurse endoscopists, there are a number of prerequisites that should be considered. NMOQ intends to develop a tool to support the initiative and its effective implementation.

10.3 Credentialing

All clinicians performing endoscopy in the public health sector should be properly credentialed by the HHS in which they operate. For medical practitioners, the Conjoint Committee for the Recognition of Training in Gastrointestinal Endoscopy provides registration and recognition of the qualification and training. This is a national body comprising representatives from the GESA, RACP and the Royal Australasian College of Surgeons (RACS). The committee recognises endoscopic training of specialist physicians and surgeons, who have completed their training in Australia or who are now practising in Australia.

There is currently no national body that recognises nurse endoscopy qualifications and training that meets the standards necessary for credentialing by the HHS. While this gap does not prevent a HHS from credentialing a registered nurse who meets the necessary criteria it does create barriers in transferability and the ability of other health providers to recognise the experience.

While the NMBA has responsibility for the initial and on-going registration of registered nurses, there is currently no statutory or formal set of standards in Australia to establish or identify an individual registered nurse as capable of undertaking endoscopy. There is a potential role for a professional nursing college or association in establishing a national set of standards to identify nurses who are able to undertake endoscopy with an associated process to recognise individuals meeting those standards. While the national health practitioner regulation system provides for public safety through the registration and accreditation processes there is clearly a need to have a credentialing process in place for nurses undertaking endoscopy to support movement of staff across employers, and provide assurance to employers and the public that nurses undertaking endoscopy meet national standards and any associated professional development requirements.
Credentialing nurse endoscopy through a professional college will validate the qualification, competencies and education of the clinician through an external body and allow transferability of practice. This would further progress the development of nurse endoscopy and enhance the visibility and contribution of registered nurses in the specialisation of gastroenterology. NMOQ will identify a relevant professional college and work with them to develop a robust credentialing process.

10.4 The level of the nurse endoscopist

The nurse endoscopist is a registered nurse educated and trained to undertake endoscopy procedures. The role requires post-graduate education to be competent and authorised to perform specific or defined tasks in a specialist area/context of practice [41].

The nurse practitioner role is distinct from other nursing roles due to the legislative and regulatory framework applied in Australia. The scope of practice of the nurse practitioner encompasses much broader service provision across the specialty of gastroenterology, rather than being limited to a defined clinical activity or task [41].

10.5 Nurse endoscopist education and training

NMOQ has developed an educational pathway for nurse endoscopists, including an academic qualification which will be able to be articulated into a Master’s degree to enable the nurse endoscopist to exit at advanced level and also if they choose continue to be considered for endorsement for nurse practitioner registration in wider gastroenterology nursing.

Entry level for nurses into the pathway is aligned with the NMBA Fact sheet for advanced practice nursing [2]. The registered nurse pathway to advanced practice is outlined in Figure 31.
10.6 Cultural change

It is fairly usual for the introduction of role substitution to be actively resisted by those affected by such a change.

It has been established that nurse endoscopists are as good as medical professionals in performing endoscopies and this practice is becoming widely accepted in many parts of the world. There is a question about the extent to which such a change in practice will be accepted in Queensland. A survey in New Zealand [42] of medical staff performing endoscopy concluded that only a minority of medical practitioners had a positive attitude towards the role of nurse endoscopists. This is in contradiction to a study undertaken in the Netherlands [43] where the majority of gastroenterologists have a positive attitude towards nurse endoscopists.

It is likely that, like New Zealand, Queensland will experience resistance to change. In the United Kingdom when nurses took on roles previously undertaken by medical practitioners, the objections for implementation included lack of professional regulation, low pay and cultural objections by doctors [44]. It will be important for Queensland to address similar concerns if nurse endoscopy is to be implemented successfully.

10.7 What is proposed

Examination of the issues and the literature has informed the development of a project to introduce nurse endoscopists in Queensland. The proposed establishment investment will provide:

1. Up to 15 nurse endoscopists at specialist nurse level trained and deployed in HHSs
2. Course materials and training programs will be developed for future training, which will meet the requirements for accreditation at a minimum of AQF level 9 (Masters equivalent) leading to the ability to perform a nurse endoscopists role at Post Graduate
Diploma level, with the ability to articulate into, or form part of, a qualification leading to nurse practitioner registration

3. Service transformation and introduction of nurse endoscopy service models with HHS workplaces ready for trained nurse endoscopists to become effective immediately to undertake procedures as members of multidisciplinary teams with consistency of quality outcomes delivered by a variety of service delivery and business models across the participating HHSs

4. Development of a credentialing system through a relevant professional nursing college or association

5. Evaluation one year post-implementation.

NMOQ will be the central coordination body for the project and will undertake a leadership role to guide and support the HHSs who will be responsible for many of the activities supporting the project objectives. The key roles and responsibilities will be developed and negotiated with participating HHSs prior to commencement of the education and training phase of the project. NMOQ will also work with the selected university developing program design and course materials and delivering training.

10.8 Will nurse endoscopists practise in isolation or independently?

No. Nurse endoscopists are not sole practitioners working in isolation. They work within multidisciplinary teams with the support of gastroenterologists. It is also recommended that appropriate level surgical support remains available in the unlikely event of complications. Where nurse endoscopists currently practise around the world, they are highly valued team members [37].

All healthcare practitioners are accountable for their own practice within their professional regulatory arrangements and scope of practice. Under professional standards [45], nurse endoscopists are responsible for their own practice within a collaborative setting.

The practice of nurses is based on collaboration and colleagueship. Collaboration is about different professionals articulating their work as they put their varying talents together to maximise the efficiency and effectiveness of the healthcare team in its delivery of health services to support consumers and families. It has been defined as the interprofessional relationships between nurses and other healthcare team members based on:

- mutual concern for consumers and their families
- professional equality in such dimensions as status, power, prestige, and access to information
- shared understanding of diversity in expertise, skills, knowledge and practice. [46]

It is fundamental good practice to communicate effectively with other healthcare professionals caring for the consumer, acknowledging and respecting the contribution of all healthcare providers. This translates into a practise environment where joint decision-making occurs with the overriding goal of better health care uniting the professions, not controlling each other’s practice [47].
Research has concluded that organisations should encourage and promote nurse autonomy without fear that undermines teamwork [46].

This concept of collaboration within an endoscopy unit, translates into assessment ('triaging') of all referrals and allocation to specific endoscopists (medical and nursing) within the unit who then take responsibility for undertaking the procedure and reporting the outcomes to the appropriate clinician.
11 Benefits

Introducing nurse endoscopists is one of a range of potential strategies to improve access and provision to endoscopy services. Others are outlined previously in this report. While nurse endoscopy cannot be seen as the single solution to endoscopy access problems in Queensland, an in-depth analysis of the information available suggests that it would be an effective and useful strategy. It may be difficult to quantify exactly the potential benefits expected through this changed model of service delivery.

The Investment Management workshop stakeholders (August 2013) recommended the following benefits and measures that will be achieved through the implementation of the strategic interventions.

11.1 Reduction in the number of people developing and dying from cancer

Approximately 1646 Queenslanders died from bowel, stomach and oesophageal cancer in 2013 [31]. A large proportion of these deaths could have been prevented through the early detection of cancerous and precancerous tissue. Approximately 80–95% of bowel cancers originate from polyps. Forming polyps are not malignant tumours, that is, they are not considered to be cancer. Over time there is a risk that a benign polyp will transform into a malignant polyp. The removal of polyps before they become malignant tumours (polypectomy), and regular surveillance thereafter, has been found to reduce bowel cancer risk by about 76–90% [48].

The progression of cancer is usually described by stages where Stage 0 is in-situ and Stage 4 represents a cancer that has become metastatic (i.e. it has spread to distant parts of the body). The survival rate at five years for Stage 3 and 4 cancers is significantly lower than that at the early stages (refer to Table 5). Diagnosis of cases of CRC through screening tends to occur two to three years before diagnosis of cases with symptoms, which can make a considerable difference to a person with Stage 1 or 2. Primarily the goal is to transform the present situation where just over 40% of all bowel cancers are initially diagnosed as Stage 1 or 2 to a situation where 66% of patients are initially diagnosed with Stage 1 or 2 cancers [49].

11.2 Better health outcomes for all Queenslanders with gastroenterology conditions

Ensuring people have access to the diagnostic, clinical and other health services when needed leads to better outcomes. It is important there is timely response and a quality service regardless of where the person lives in Queensland. In the context of endoscopy, the two key indicators are the time from referral to diagnosis and the time from diagnosis to the first treatment. Improvement in both of these factors will make a measurable impact in health outcomes.

In the United Kingdom, the NHS achieved endoscopy bookings within two weeks for critical cases and six weeks for all other appropriate referrals [28].
It is also important to ensure patients have timely access to treatment following diagnosis. Caution must be exercised against developing strategies and solutions that commit all available skilled resources at the diagnostic endoscopies to the potential detriment of maintaining timeliness of progressing treatment lists. This benefit highlights the importance of maintaining balance in providing timely diagnosis, treatment and monitoring endoscopy services.

### 11.3 Reduced burden of care for gastroenterology patients

The third benefit focuses on reducing the burden of care to the individual, their immediate carers and to the State of Queensland. Whilst the first two benefits provide very positive outcomes for patients, they must be delivered within the context of a sustainable model of care. It is crucial that the financial costs of delivering services are affordable and sustainable as services grow. The earlier a patient can be diagnosed the greater the potential for cost efficiency.

Endoscopy is an essential tool in the diagnosis and intervention of multiple medical conditions. Other alternatives to endoscopy such as CT colonography and barium enema are not as effective or as readily available as endoscopy.

The *Blueprint for better healthcare in Queensland* has set Queensland Health the target of achieving a lower price than the national efficient rate. This measure aims to base Queensland’s performance against the national efficient price.

Key performance measures are suggested to enable ongoing measurement of the impact of the introduction of nurse endoscopy and other service improvements (Refer Table 6).

**Table 6 Proposed key performance measures for endoscopic services**

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Key performance indicator</th>
<th>Measure</th>
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<tbody>
<tr>
<td>Reduction in the number of people that develop and die from cancer</td>
<td>Cancer prevented by polypectomy</td>
<td>Adenoma polyps detected and removed</td>
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<td>Adenoma polyp detection rate per endoscopy</td>
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<td></td>
<td>Cancers detected early</td>
<td>Cancer stage on first endoscopy for bowel cancer</td>
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<td>Cancer stage on first endoscopy for stomach cancer</td>
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<td>Cancer stage on first endoscopy for oesophagus cancer</td>
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<td>Proportion of mis-staged cancers based on the difference between pre and post-surgery for bowel cancers</td>
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<tr>
<td>Better health outcomes for all Queenslanders with gastroenterology conditions</td>
<td>Reduced time from referral to diagnosis</td>
<td>Time from referral to actual public health endoscopy procedure</td>
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<td></td>
<td>Reduced time from diagnosis to first treatment</td>
<td>Time from endoscopy diagnosis to first clinical treatment</td>
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<td>Reduced burden of care for gastroenterology patients</td>
<td>Reduced clinical pathway costs</td>
<td>Cost of care based on cancer stage and the published cost of bowel cancer treatment</td>
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<tr>
<td></td>
<td>Reduced cost of endoscopy</td>
<td>Endoscopy efficient price versus national efficient price</td>
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Abbreviations

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AQF</td>
<td>Australian Qualifications Framework</td>
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<td>CRC</td>
<td>Colorectal cancer</td>
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<td>DALYs</td>
<td>Disability adjusted life years</td>
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<td>MINuET</td>
<td>A Multi-Institution Nurse Endoscopy Trial</td>
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