Health Technology Assessment Program

Annual Report 2011-2012

Clinical Access and Redesign Unit
Health Service and Clinical Innovation Division
Queensland Health
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Executive Summary

Queensland Health’s Health Technology Assessment (HTA) Program provides valuable support to Hospital and Health Services (HHSs) and Queensland Health on the introduction and evaluation of new medical technologies. HTA assists decision making by HHS management, clinicians and the System Manager by ensuring that new health technologies and clinical practices are safe, effective and cost-effective.

HTA aligns with the strategic objectives of the Queensland Government. HTA results in better services for patients through the adoption of appropriate technological innovation. It helps to achieve better healthcare in the community by assessing technologies that open up the treatment options for patients in the setting that is most appropriate for them. HTA empowers frontline staff by ensuring the evidence-based provision of cutting-edge technological innovation. It can empower local communities by providing evidence and advice to local decision makers by identifying population need and how technology can be used to meet that need. HTA ensures value for money for taxpayers as cost-effectiveness is a core component of the team’s analytic methodology. HTA supports openness through the use of an evidence-based methodology with oversight from expert clinicians.

Twenty-one assessment reports were produced by the HTA team in the 2011-12 financial year in addition to non-report advice items throughout the year. These assessments were used to guide treatment decisions for various conditions including stroke, epilepsy, cardiac failure, liver fibrosis, tuberculosis, chronic obstructive pulmonary disease, decompression illness, smoke inhalation, chronic kidney disease, congenital heart abnormality, high blood pressure and cancer. The use of assessment reports varies from assisting with local purchasing decisions to guiding the establishment of a new statewide specialty service. The patient cohorts technologies are used to treat vary from low numbers of patients requiring a specialised treatment to large numbers of patients targeted for a diagnostic service.

The HTA team continues to adapt its analysis to present demands relevant to HHSs, for example, by including an analysis of implications of activity based funding and National reform activity targets.
Foreword

In its third year of operation, Queensland Health’s Health Technology Assessment (HTA) Program continues to provide valuable support to Hospital and Health Services (HHSs) and Queensland Health on the introduction and evaluation of new health technologies in the public sector. The Program assists clinical decision-making and technology management by ensuring that new health technologies and clinical practice introduced into Queensland’s public healthcare system are safe and effective. The HTA team, positioned within the Clinical Access and Redesign Unit (CARU) (previously known as Access Improvement Service), generates independent research, analysis and advice pertaining to the introduction of new and emerging health technologies across a broad spectrum of medical specialties.

The two-tiered system of district level and system manager HTA has assisted HHSs in making clinical decisions on the adoption or non-adoption of technologies. This approach is particularly important given the demand for health services will continue to grow due to an ageing population and growing prevalence of chronic disease. At the same time, the provision of health services occurs in an environment of fiscal constraint and a focus on value for money of healthcare expenditure. The National Health Reform Agreement, which includes the introduction of Activity Based Funding (ABF), will also have implications for the adoption of new medical technology.

This Annual Report provides an overview of the activities and outcomes of the HTA Program from 1 July 2011 to 30 June 2012.

Strategic Alignment

Priority areas for the HTA Program, which are aligned to the objectives of CARU, include:

- introducing safe and effective health technologies;
- ensuring equitable patient access to health services;
- improving patient flow through acute health services;
- decreasing elective surgery waiting lists for acute health services; and
- enhancing service delivery for the major hospital redevelopment projects underway across the state.

What is Health Technology Assessment?

Technological innovation has achieved remarkable advances in health care. However, it has also contributed considerably to increases in health care expenditure. Budgets are finite and choices must be made about which technologies to purchase. There is a need to establish priorities in the selection and management of technological innovation in the health care sector.

Health Technology Assessment (HTA) provides Hospital and Health Services (HHSs), Hospital and Health Boards (HHBs), hospital management, policy-makers, purchasers and planners with the evidence, analysis and recommendations needed to make informed decisions that harness the benefits of technology while getting the best value for every health care dollar.

HTA is the systematic process of identifying new medical technologies, evaluating their key dimensions and effects, and monitoring their diffusion into clinical practice. The key objective is to establish whether a technology is safe, efficacious, effective and cost-effective.

It’s all about informing technology-related policy-making in health care in order to improve the uptake of cost-effective new technologies and preventing the adoption of technologies that offer limited value for the health care system.
In June 2012, the new Queensland Government released a *Statement of Government Health Priorities*, reinforcing its commitment to better healthcare outcomes for Queenslanders. This is based on a clear focus on patients and clinicians with a shift of resources to the frontline of health care and ensuring that every dollar spent on health provides value for money for patients. Six values are listed and HTA contributes to putting each one into practice.

- Better services for patients – technological innovation is a key driver of higher quality health services and improved health outcomes. HTA ensures that new technologies result in better services.
- Better healthcare in the community – technological innovation expands treatment options available to clinicians and opens up availability of treatments in the setting that is most appropriate for patients. HTA helps to tailor the adoption of technology to the needs to Queenslanders and the priorities of HHSs.
- Valuing our employees and empowering frontline staff – technological innovation encourages and enables clinicians’ professional development and provides them with the cutting-edge tools they need to treat their patients. HTA ensures the evidence-based provision of these treatment options.
- Empowering local communities with a greater say over their hospital and local health services – interest and demand for purchasing new technologies is often initiated by local clinicians responding to the demands and needs of their local communities. HTA helps local decision-makers to identify clinical and population need and how technology can be used to meet that need.
- Value for money for taxpayers – cost-effectiveness is one of the core tenets of the HTA process preceding the purchase of new technologies.
- Openness – the HTA process ensures that adoption of new technologies is evidence-based and transparent, including oversight by expert clinicians.

Some specific strategies that the HTA Team will adopt to broaden its remit to assist with major health priorities in the state are:

- Health technology assessments adapted to the local needs of the new HHSs that started from July 2012.
- The HTA team will provide advice on how new technologies will affect service delivery under the new ABF framework.
- The HTA team will provide evidence based advice on new technologies that are being considered in the redevelopment projects at the Queensland Children’s Hospital, Sunshine Coast University Hospital and Gold Coast University Hospital.
- Ongoing coordination of evaluation pilots for technologies funded by the New Technology Funding and Evaluation Program.
- Helping HHSs to access medical technology that may provide cost-saving opportunities.
- Helping HHSs to identify those technologies and procedures that are no longer supported by the latest evidence and offer cost-saving opportunities through disinvestment.
Advisory Groups

Queensland Policy and Advisory Committee on New Technology (QPACT)

QPACT is comprised of clinicians, hospital managers, researchers and health service planners who provide advice to Queensland Health on the adoption, diffusion, implementation and evaluation of new health technologies and their role in clinical practice. QPACT’s main function in 2011-12 was to oversee the New Technology Funding and Evaluation Program (NTFEP) which encouraged Queensland Health clinicians and HHSs to apply for funding to assist with the introduction and evaluation of technologies that are new to Queensland, Australia or the public health system. QPACT will continue to monitor the implementation and evaluation of technologies purchased through the NTFEP, however, now that the NTFEP has been discontinued, QPACT has refocussed its role to analysing the broader strategic context of health technology across the state. For example, it recently developed recommendations for an obesity management service for a select cohort of patients where it has been shown to be most effective, and a comprehensive epilepsy program for patients suffering from refractory epilepsy. Evaluations for technologies funded in 2009-10 are being finalised and recommendations will be made to the District Chief Executive Officers regarding the outcomes of each evaluation.

QPACT membership:

- Dr Stephen Ayre, Executive Director of Medical Services, The Prince Charles Hospital and member representing the Directors of Medical Services Advisory Committee (DOMSAC)
- Ms Veronica Casey, Executive Director, Nursing Services, Princess Alexandra Hospital and District Director of Nursing and Midwifery
- Professor Kwun Fong, Senior Staff Specialist, Department of Thoracic Medicine, The Prince Charles Hospital
- Dr John Hill, Director, Clinical Cardiac Pacing and Electrophysiology, Princess Alexandra Hospital
- Ms Elizabeth Hudson*, Nurse Unit Manager, Clinical Resources and Equipment Service, Nambour General Hospital
- Professor Michael Humphrey, Clinical Advisor, Office of Rural and Remote Health
- Dr Jane Jacobs, Director, Office of Health and Medical Research
- Ms Colleen Jen, Director, Planning Branch, Health Infrastructure and Projects Division
- Dr Andrew Johnson, Executive Director of Medical Services, The Townsville Hospital, Chair of QPACT
- Mr Spiros Katopodis, Operations Manager and Radiation Safety Officer, Medical Imaging, Toowoomba and Darling Downs Hospital and Health Service
- Mr Stephen Lane*, District Director, Medical Imaging Services, Wide Bay Health Service District
- A/Professor Julie McGaughran, Director, Genetic Health Queensland
- Professor Keith McNeil, District CEO, Metro North Health Service District
Eight medical technologies were approved for funding by QPACT under the NTFEP in 2011-12:

- BioNESS L300 System for stroke patients and foot drop
- EX VIVO Lung Perfusion for marginal donor organs
- Fibroscan for diagnosis of liver fibrosis
- GeneXpert for rapid detection of M. Tuberculosis complex and rifampicin resistance
- CVX-300 Excimer Laser System for removal of pacemaker and defibrillator leads
- Medtronic Symplicity Renal Denervation System for resistant hypertension
- Monoplace Recompression Chamber for hyperbaric oxygen therapy
- NxStage System One home haemodialysis for end-stage kidney disease

Appendix 1 contains an update of technologies supported under the NTFEP from 2009-2012.

District Advisory Committees

The district advisory committees respond to technology requests from clinicians in their local areas to assess a technology in terms of the clinical evidence, organisational feasibility and value for money. The five district advisory committees for new technology continued to operate throughout 2011-12 with the HTA team providing secretariat support:

- Gold Coast Advisory Committee for New Technology (GC ACT)
- Metro North for Central Queensland Advisory Committee for New Technology (MNCQACT)
- Northern Queensland Advisory Committee for New Technology (NQACT)
- Paediatric Advisory Committee for New Technology (PaedACT)
- Southern Queensland Advisory Committee for New Technology (SQACT)

Appendix 2 provides an overview of the technologies reviewed by District Committees in 2012.

Standardisation of Assessment Reports

This year the HTA team embarked on a process to standardise the mini-HTA research reports it produces so that HHSs have a clear idea of what to expect when they request an assessment. The HTA team can provide the following resources, or analytic products, to clinicians or health executives upon request. These research products are designed to balance the need for depth and rigor with timeliness of delivery and can be prepared following an expression of interest from a Queensland Health clinician or management.
**Technology Overview**
A Technology Overview is a two page summary of the basic components of introducing a new technology. It outlines the how the technology works and the conditions it treats, current practice, salient evidence, cost, and organizational issues.
Estimated turnaround time: 2 weeks

**Rapid Evidence Scan**
A Rapid Evidence Scan summarises the current evidence on a new technology based on database searches and literature abstracts.
Estimated turnaround time: 3 weeks

**Due Diligence**
A Due Diligence reports and assesses the available evidence on a technology including a critique of salient literature and can be considered a mini systematic review. It includes an analysis of how the technology works, clinical and population need, safety, effectiveness, cost-effectiveness, organisational feasibility, budget requirements, and social values and ethics. The HTA team will consult with clinical experts and relevant parts of Queensland Health such as Biomedical Technology Services, Information Division, Planning Branch and advisory committees for input. This was the assessment type used to guide decisions relating to NTFEP funding applications.
Estimated turnaround time: 4 weeks

**Economic Evaluation**
There are four main types of economic evaluation in health care: cost analysis (or cost-minimisation analysis), cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis. The methodology usually involves decision analytic modelling where hypothetical cohorts of patients experience a range of possible health outcomes and cost consequences following alternative treatment options. Sensitivity analysis of different scenarios and uncertainty analysis of estimated parameters are also included to test the robustness of conclusions and the impact of changes to inputted assumptions.
Estimated turnaround time: 10 weeks

**Systematic Review**
A Systematic Review uses transparent procedures to systematically and rigorously locate and appraise the quality of existing research evidence and synthesise and interpret the results of relevant research in order to sum up the best available research on a specific question. The procedures are explicitly defined in advance to ensure that the exercise can be replicated and to minimise bias. It must include clear inclusion/exclusion criteria, an explicit search strategy, quality assessments of included studies, data extraction and synthesis. Peer review is a key part of the process.
Estimated turnaround time: 9-12 months

**Health Technology Assessment**
A full health technology assessment includes a systematic review (possibly with meta-analysis), economic evaluation (usually based on decision analytic modelling) resulting in a comprehensive
summary of existing evidence and detailed recommendations to guide the decision-making process on the most appropriate allocation of resources. It may also include a budget impact analysis. Estimated turnaround time: 12-24 months

Activity Based Funding

The implementation of the National Health Reform Agreement will see the introduction of a new structure for the health system in Queensland. Under this system, HHSs will become the providers of healthcare and Queensland Health, as the System Manager, will focus on system-wide policy, planning and service purchasing in addition to well established functions such as supporting system-wide quality and safety and service innovation. Another component of the reforms is the introduction of activity based funding (ABF) - a new funding framework to manage the delivery of healthcare services across Queensland. The objectives of a casemix hospital payment system are to increase efficiency, activity and transparency; reduce waiting times and length of stay; support patient choice; enhance quality care and encourage competition between hospitals. However, in some circumstances, the technical ABF model may not align with strategic healthcare objectives, particularly regarding new services driven by technology. The HTA team will now incorporate an analysis of the implications of ABF and the current patient classification system in all technology assessments to assist HHSs with their transition to ABF.

Technologies

This section provides a summary of each medical technology the HTA program assessed during 2011-12 in alphabetical order. This includes brief comments on the technology, what it’s used for, findings of the assessment, action taken and what the future holds. The full assessment reports can be provided by the HTA team upon request.

<table>
<thead>
<tr>
<th>BioNESS L300 System</th>
<th>Assessment type: Due Diligence Report</th>
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<td>Requested by: QPACT</td>
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<td></td>
<td>Purpose: NTFEP Application</td>
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The BioNESS L300 is a wireless electrical stimulation (ES) unit, used to provide peroneal nerve stimulation to promote ankle dorsiflexion after ‘toe off’ and during the swing phase of gait. The system is used to support functional gait in acute and sub-acute stroke patients who demonstrate foot drop as a result of first time stroke. Improved gait has a direct impact on patient safety, community participation after discharge and quality of life. In addition, enabling safer gait over a variety of terrain reduces the risk of falls.

The HTA team’s Due Diligence found there is little evidence to suggest that there are major safety concerns related to the technology, although the long term effects of chronic use of external electrical stimulation devices is unknown. There were limited available studies that directly compared the new technology with
physiotherapist manipulation. The studies that were available were generally not of high quality and often had little statistical power due to small numbers of participants. Of the literature that was assessed, the outcomes were, on the whole more positive than negative. Many studies suggested that more research should be undertaken on larger patient groups to further assess the intervention.

Following a review of the Due Diligence and discussion on the available evidence, QPACT approved funding from the 2011-12 NTFEP to enable the purchase and evaluation of the technology, including resources for a Project Officer. The BioNESS L300 is now being used in practice at the RBWH to assist Queensland patients to recover from stoke. The evaluation is in its early stages with an evaluation report due in 2013.

**Comprehensive Epilepsy Program**

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<tr>
<th>Assessment type: Full Health Technology Assessment Requested by: QPACT Purpose: Potential statewide specialty service</th>
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In late 2009, QPACT received an application from a Brisbane metropolitan hospital for the establishment of a Comprehensive Epilepsy Program (CEP). There has been interest among clinicians in establishing a CEP in Queensland for many years. The uptake of such a program has been widespread throughout Australia, with approximately 16 specialised refractory epilepsy units in Australia. To date, Queensland refractory epilepsy patients have been referred to Austin Health in Melbourne, Victoria. QPACT commissioned a full HTA report on epilepsy surgery, including pre-surgical evaluation, to determine the viability of establishing such a service in Queensland. The HTA team, Clinical Access and Redesign Unit, completed the systematic review, economic modelling and consideration of organisational and ethical factors.

The findings from the HTA report were that epilepsy surgery offers an effective and cost-effective treatment for patients with medically refractory epilepsy because it improves seizure control and quality of life for patients. Pre-surgical evaluation by a multidisciplinary team is critical to select suitable candidates. Based on the evidence, it is appropriate that an epilepsy surgery program be established for Queensland patients with medically refractory epilepsy. A single epilepsy surgery centre is recommended to maintain both expertise in the centre and ensure the quality and safety of the program.

The findings and recommendations from this report have been communicated to the appropriate stakeholders and Queensland Health executives to ensure they are considered for establishment under the new purchasing framework for Queensland Health in subsequent years.

**CVX-300 Excimer Laser System**

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<th>Assessment type: Due Diligence Requested by: QPACT Purpose: NTFEP Application</th>
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Implantable cardioverter defibrillators (ICDs) and pacemakers are battery-powered electronic devices which include electrode wires (leads) that pass through a vein to the right chambers of the heart. Following implantation, thrombus form on the ICD/pacemaker leads and over time fibrosis develops, causing the lead to tightly attach to the vascular endothelium making it difficult to extract. The main indications for lead extract include infection, mechanical/impending failure of the device.
and device revision or upgrade. Laser lead extraction is intended for removal of ICD or pacemaker leads in which simple extraction with the aid of a locking stylet has failed.

The HTA team’s Due Diligence identified a full assessment undertaken by the National Institute for Health and Clinical Excellence (NICE) in the UK in 2002 which concluded that evidence on the safety and efficacy of laser removal of pacing leads appeared adequate to support the use of the procedure. Five comparative studies and four medium to large case series studies were also included in the HTA team’s analysis to account for more recent literature. The Due Diligence concluded that the current evidence based supported the use of laser sheath removal but it should be used only in patients for whom conventional methods of removal are unsuccessful.

QPACT approved funding from the NTFEP for the laser lead extraction system to be evaluated in a Queensland context over the course of 2012 with the report due 2013.

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<tr>
<th>DaVinci Robotic Surgery</th>
<th>Assessment type: Due Diligence</th>
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<td>Requested by: QPACT</td>
<td>Purpose: NTFEP Application</td>
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The Da Vinci surgical system is a robotic device. There are four main components to the system: (1) the surgeon’s console, where the surgeon sits and views a magnified three-dimensional image of the surgical field; (2) patient cart which sits beside the patient and consists of three instrument arms and one endoscope arm; (3) detachable instruments which simulate fine motor human movements - the hand movements of the surgeon’s hands at the surgeon’s console are translated into smaller ones by the robotic device and are acted out by the attached instruments; and (4) a three-dimensional vision system - the camera unit or endoscope arm. The application to QPACT was for funding to expand the conditions the existing equipment is used for to gynaecological surgery.

The HTA Team’s Due Diligence concluded that, when compared with open surgery, the Da Vinci robotic system generally has a similar safety profile with respect to the proportion of patients with complications, except that the Da Vinci was associated with fewer complications in hysterectomy for the staging of endometrial cancer than open surgery. The Da Vinci robotic system is as safe as conventional laparoscopic surgery. Compared with conventional laparoscopic surgery, the short-term benefits achieved by the Da Vinci robotic system for hysterectomy in terms of blood loss and hospital stay are not substantial and are of questionable clinical importance. In addition, the operation time was largely comparable between the two groups. Little information is available in regard to the long-term patient-relevant outcomes of the Da Vinci robotic system compared to either open surgery or conventional laparoscopic surgery.

The RBWH currently has a Da Vinci system that is regularly used to treat patients. QPACT did not approve additional funding on the basis that the application was for recurrent costs for the alternative use of existing technology and, therefore, outside the scope of the NTFEP.
Ex Vivo Lung Perfusion

The Ex Vivo Lung Perfusion system (EVLP) is a new method for donor lung preservation prior to transplantation. The EVLP system aims to keep a pair of lungs slowly breathing inside a sterile glass dome while attached to a ventilator, pump and filters, being maintained at 37 degrees Celsius and perfused with Steen solution. It is claimed that the lung can be maintained in this system for up to 12 hours, enabling surgeons to assess lung function and even repair the lungs. It is proposed by the applicants that EVLP can be used to assess and treat marginal donor lungs to potentially increase the number of lungs available for transplantation in Queensland, from approximately 18 per year (currently) to 27 per year – a 45 to 50 per cent increase in lung transplant numbers. Complications such as pulmonary oedema, contusions, and vascular thrombosis have typically rendered donor lungs unacceptable for transplantation, thereby reducing the supply of donor lungs.

All studies identified by the Due Diligence found no difference between reconditioned marginal donor lung transplant outcomes and conventional donor lung outcomes, although studies were small in subject numbers and were of a lower evidence level. The Due Diligence concluded that EVLP had been demonstrated to be safe and effective although the level of evidence is predominantly based on case series reports and one prospective nonrandomised trial.

QPACT approved funding from the 2011-12 NTFEP for an evaluation of EVLP with findings to be reported in 2013.

Fibroscan

Elastography is an emerging technique capable of non-invasively assessing the extent of liver fibrosis. Transient elastography can be performed using the commercially available Fibroscan device. A Fibroscan test is conducted by placing a probe in an intercostal space over the patient’s liver triggering a shear wave which is tracked through the liver using the ultra sound element of the probe. The device emits a low-frequency vibration that induces an elastic shear wave in the liver tissue. Meanwhile a pulse-echo ultrasound is used to follow the propagation of the shear wave through the tissue and record its velocity. The speed of the shear wave is directly related to the degree of fibrosis in the liver. The harder or more fibrotic the tissue, the faster the shear wave propagates. The main indications are chronic Hepatitis B and C, Alcoholic Liver Disease (ALD) and Non-Alcoholic Fatty Liver Disease (NAFLD). Initially the Fibroscan may be used for screening tool to reduce the number of patients requiring liver biopsy, an invasive procedure, and also to measure ongoing response to treatment. In some patients, the initial screening may be sufficiently well-defined to provide a confident assessment of their stage of liver fibrosis.

The Due Diligence found that Fibroscan appears to be a safe and highly reproducible, non-invasive diagnostic technology for liver fibrosis and liver cirrhosis. The literature confirmed liver biopsy has more significant side-effects and is therefore not always taken up by patients. Regarding efficacy,
the literature suggested that Fibroscan is a useful tool for diagnosing liver fibrosis especially in patients with more severe fibrosis or cirrhosis when compared to liver biopsy. The assessment concluded that it is a highly reproducible and easy to operate technology, particularly useful in the ongoing management of chronic liver diseases. However, the development of liver stiffness measurement threshold levels and algorithms for liver fibrosis will help to determine the reliability and maximum diagnostic accuracy of this technology.

Funding was approved from the NTFEP for the purchase of two units – one for the Princess Alexandra Hospital and one for the Royal Brisbane and Women’s Hospital. Fibroscan has been used to significantly reduce the liver fibrosis staging waiting lists at both hospitals with a focus on patients with Hepatitis B and C. It will continue to be evaluated over the 12 month pilot period with the findings to inform further statewide adoption in Queensland.

### Flex Focus Ultrasound

The Flex Focus 400 ultrasound and transducers BK 8838 and BK 2052, both with endovaginal and endorectal 3D capability, enable early diagnosis of the perineal trauma and early and effective patient management. The technology was proposed to be used on all women after their first normal delivery of a child as an add-on to clinical examination. The technology allows visualisation of the pelvic floor as well as the structures that attach to the perineal body.

The Due Diligence found that there is some evidence with moderate quality demonstrating the effectiveness of endoanal ultrasound diagnosis, follow by repair, of sphincter damage in preventing faecal incontinence after vaginal delivery, and on the diagnostic accuracy of endoanal ultrasound of sphincter injury. However, there was uncertainty around whether this was a new technology or whether existing, readily available ultrasound equipment, could be used to pilot screening for perineal trauma.

QPACT did not approve funding for the Flex Focus from the NTFEP as it was not sufficiency unique from existing ultrasound devices. QPACT saw the proposal as a valuable research project on early diagnosis of perineal trauma and early patient management and encouraged the applicants to apply to research funding organisations.

### GeneXpert

GeneXpert is a modular system for rapid diagnosis of infectious disease. It integrates and automates sample processing, nucleic acid extraction, amplification and detection of the target sequences using nested semi-quantitative real-time PCR technology. The system requires the use of single self-contained cartridges that hold the PCR reagents and host the PCR process, which eliminates sample cross contamination. Xpert-MTB/Rif is an automated molecular test that simultaneously detects M. Tuberculosis (MTB) and resistance to Rifampicin from a single sputum sample. Detection by Xpert MTB/Rif takes less than two hours from sample receipt in the laboratory, comparable to smear microscopy and many times faster than culture-based technique (7-42 days) of growing TB and
performing drug susceptibility testing. This was proposed to result in an improvement in more appropriate use of first- and second-line antituberculosis drugs, rational use of infection control resources, opportunity to limit spread of highly drug-resistant TB to the community, and greater patient satisfaction.

The Due Diligence found that results from different level and quality studies were consistent for the diagnostic accuracy of Xper MTB/Rif in tuberculosis case detection and rifampicin resistance detection. The assessment confirmed that the clinical need for Xpert MTB/Rif is significant. It also found that Queensland was the only state in Australia where there was no access to the proposed technology despite the fact that Queensland manages the most patients with MDR-TB in Australia.

QPACT subsequently approved funding from the 2011-12 round of the NTFEP for purchase of the technology and an evaluation of GeneXpert in the Queensland context.

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<th>Human Milk Bank</th>
<th>Assessment type: Due Diligence</th>
<th>Requested by: NQACT</th>
<th>Purpose: Inform local service establishment</th>
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Human breast milk is the recommended form of enteral nutrition for all infants, including those born preterm. Donor breast milk is an alternative form of milk when a mother’s own milk is not available or is in short supply. A human milk bank collects, screens, pasteurises and distributes donor human milk for use by a recipient that is not the mother’s own baby.

Necrotising enterocolitis (NEC) is a gastrointestinal disease affecting premature infants that can be life-threatening and is a leading cause of mortality and morbidity among infants in Neonatal Intensive Care Units (NICUs). There is no definitive cause identified for NEC, although infection, empirical use of antibiotics for more than 5 days and enteral feeding are thought to be involved. With an early diagnosis, NEC can be treated medically through cessation of feeds, use of parental nutrition and antibiotic treatment. If medical treatment is unsuccessful surgery may be required to remove the affected bowel.

The Due Diligence conducted by the HTA Team found that the evidence on the benefits of donor human milk compared with formula milk for preterm infants was limited. The age of the studies (primarily from the 1970s and 1980s) has an effect on the applicability of them in current practice, given the care and feeding practice of the preterm baby has changed over time. Donor human milk given as a sole diet appears to be associated with a lower risk of NEC but slower growth in the early postnatal period compared with formula milk. The Due Diligence concluded that the long-term effect of donor milk compared with formula milk was unclear. NQACT did not recommend establishing a human milk bank at The Townsville Hospital at this point in time because there are significant costs, space and infrastructure required to set up the service and the long-term benefits of setting up a service was not clear.
### InterVapor

The InterVapor System, also known as Bronchoscopic Thermal Vapour Ablation (BTVA), is a minimally invasive bronchoscope with accessories designed to deliver heated water vapour to lung tissue to treat emphysema. To begin treatment, the physician inserts a bronchoscope into the target airway and places the catheter through the bronroscope. An occlusion balloon at the end of the catheter is inflated, and the physician applies the heated water vapour. The catheter delivers the water vapour to the lung segments typically in 3 to 10 second bursts. The procedure takes about 30 minutes to complete and treats three to eight lung segments from one lobe.

Two case series studies with small cohorts were identified in the review. Early results of the latest study were encouraging with a satisfactory safety profile and significant improvements in lung function, exercise capacity and disease-specific quality of life at 6 months, although these must be interpreted with caution in the absence of a control group. No studies were identified that compare BTVA with lung volume reduction surgery, endobronchial valves, endobronchial coils or optimal medical management. Further research is required comparing BTVA’s safety, effectiveness and cost-effectiveness to alternative interventions before it is adopted in routine clinical practice.

### MitraClip

The MitraClip is a catheter-based, minimally invasive treatment for grade 3+ or 4+ mitral regurgitation. It is a system of devices intended for the percutaneous reconstruction of an insufficient mitral valve. The MitraClip system is based on the principle of edge to edge repair for mitral valve repair and the procedure is undertaken percutaneously, with the clip being delivered through the femoral vein and into the left atrium via trans-septal puncture.

The Due Diligence found there was some evidence of moderate quality demonstrating the effectiveness of MitraClip in patients who were fit for mitral valve surgery. For high surgical risk patients, there was uncertainty in the estimates of benefits, risks and burdens from the literature. All studies except for one were sponsored by the industry. Subsequently, the report concluded that the level of evidence was low and based on a number of level IV studies.

QPACT did not recommend funding for the introduction of MitraClip on the basis of insufficient clinical and cost-effectiveness data to support the use of the technology. The committee will monitor MitraClip over the next 12 months for the emergence of any new evidence.
Monoplace Recompression Chamber

Hyperbaric Oxygen Therapy (HBOT) is a clinically accepted treatment option for a number of medical conditions such as decompression illness, arterial gas embolus, microvascular ischaemias and smoke inhalation. It involves the intermittent inhalation of pure oxygen in chambers pressurised above one atmosphere absolute. HBOT is administered in two types of chambers. In a multiplace chamber, oxygen is delivered to the patient via a mask, hood or endotracheal tube. Multiplace chambers can accommodate several occupants, including observers and medical and support personnel. A monoplace chamber can accommodate one patient and can be pressurised with either pure oxygen or air. The smaller size of the chamber provides relative portability and lower cost, but imposes limits on ready access to the patient. The major advantages of the monoplace chamber are that it is a more efficient and more comfortable delivery of HBOT in a subset of patients, provides the ability to treat patients for whom set multiplace recompression times of operation are unsuitable (for example, due to infection), avoidance of exposure to the inside nurse to the risk of barotrauma and decompression illness, and faster removal of the recompression chamber as there is no risk of decompression illness because there is no exposure to air.

The Due Diligence found that there were no studies that compare the safety or effectiveness of multiplace and monoplace chambers as it is seen that they deliver the same therapeutic effect. However, the author cautioned there is increased risk of fire in the monoplace chamber as pure oxygen is used to pressurise the chamber.

QPACT recommended the Monoplace Recompression Chamber for HBOT be conditionally funded under the 2011-12 NTFEP including quarterly reporting of key performance indicators to monitor its usage, occupancy rate and further output data.

NxStage System One

The NxStage System One is a haemodialysis machine purpose-built for use at home. Compared to conventional haemodialysis devices, NxStage is smaller in size, involves less of an installation footprint, uses far less water and electricity, is easier to use, and is portable – providing the opportunity for travel for patients previously restricted to locations with ready access to dialysis. Home dialysis has been shown to improve health outcomes compared to in-centre dialysis at the same time as being cost-saving. There are also purchasing incentives built into the new ABF framework that encourage the shift to home dialysis. NxStage is seen as one tool that can potentially be used to increase the numbers of patients dialysing in their own homes.

Following a Due Diligence assessment by the HTA team, QPACT approved funding from the NTFEP for a managed entry pilot project of the unit at two sites, Princess Alexandra Hospital and Cairns Base Hospital. This was to be conducted under an evaluation framework including support for a
Statewide Project Director based at the PAH and a Project Officer based at CBH to manage procurement, implementation, clinical management, data collection and evaluation reporting. More than 5,000 patients worldwide have used the unit but this was the first time the system had been introduced to Australia for dedicated patient use. The benefit of a limited implementation and a structured pilot under evaluation requirements was highlighted early in the project with a range of organisational and logistical challenges experienced due to how new the technology was to the distributer, dialysis clinicians and patients.

Thanks to a dedicated project team, a number of achievements are now being realised. Seven patients are dialysing at home in South East QLD that otherwise would have relied on in-centre resources. Five patients are dialysing at home in North Queensland. One of these patients has just returned home to Darnley Island in Torres Strait - this is the first time she has been able to go home after dialysing in-centre for last five years. The pilot has been expanded to a third site at the Gold Coast and PAH has purchased additional machines. The evaluation is ongoing with a report due early 2013.

<table>
<thead>
<tr>
<th>O-Arm</th>
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</table>

**Assessment type:** Technology Overview  
**Requested by:** GCACT  
**Purpose:** Inform hospital redevelopment project

The O-arm system is an evolution from the conventional C-arm system, offering high-quality, volumetric imaging for intra-operative applications. The O-arm can perform radiography, 2D fluoroscopy and 3D volumetric imaging. The system consists of 2 parts: a mobile view station and an x-ray stand. The mobile view station has image processors, a user interface for image and patient handling, and viewing monitors. The x-ray stand has an x-ray generator, a flat-panel detector and an x-ray control user interface. Two features unique to the O-arm are integration with the Medtronic StealthStation navigation system and the ability to rotate 360 degrees around the patient. It also has a robotic feature that allows the O-arm to be repositioned quickly without additional radiation exposures, a fast setup time, and the potential to reduce the use of diagnostic CT scans for verification imaging. Potential disadvantages are: it is a large device that requires considerable floor space for storage and positioning around the table; it is relatively expensive; and it may need to be repositioned more frequently than C-arms because the surgeon has less direct access to the patient. The O-arm is most often used for spinal surgery.

The HTA team identified one study that compared the accuracy of pedicle screw placement which resulted in a higher pedicle screw placement accuracy rate of 99% in the O-arm navigated group compared to 94.1% in the free-hand group. The Technology Overview concluded that there was limited clinical experience to date with the technique and data examining its accuracy.

The Gold Coast Redevelopment Project team will be able to use the information provided in the Technology Overview to guide its purchasing decisions for the new hospital.
Obesity Management

QPACT commissioned a HTA report on an Obesity Management Service in 2009 to guide Queensland Health’s policy position on obesity management, multidisciplinary care and bariatric surgery. For the severely obese, nonsurgical methods such as diet, exercise and behavioural modifications are usually ineffective and rarely result in sustained weight loss. Surgery is the only treatment that has been proven to consistently achieve long-term reduction of excess weight in patients with severe clinical obesity.

Access Economics (now known as Deloitte Access Economics) was selected undertake the HTA including a systematic review and cost-effectiveness analysis. The systematic review component of the HTA found evidence that bariatric surgery is highly effective. Resolution of diabetes ranges from 61% to 81% post-surgery. Resolution of hypertension occurs in 59% to 74% of patients post-surgery leading to a reduction in cardiovascular disease. No surgery is without complications and with bariatric surgery, these can occur in up to 4.1% of patients and are associated with comorbidities. The cost-effectiveness of bariatric surgery is supported by the literature and tends to increase in patients with higher BMI (because of the higher risk of obesity-related comorbidities), younger patients (because there is more time for the patient to benefit from weight loss especially in terms of preventing secondary diseases) and those with newly diagnosed type 2 diabetes (due to a higher diabetes remission rate).

These conclusions are consistent with international findings. The Ontario Health Technology Advisory Committee recommends that bariatric surgery should be considered an effective technique for the treatment of morbidly obese people in whom prior nonsurgical approaches to weight loss have failed. Also, the Canadian Agency for Drugs and Technology in Health have found that bariatric surgery seems to be more effective than standard care for the treatment of severe obesity in adults based on a systematic review of 63 clinical trials. Bariatric surgery is supported in New Zealand with the Ministry of Health recently increasing funding for additional procedures.

The findings and recommendations from this report have been communicated to the appropriate stakeholders to ensure they are considered for establishment under the new purchasing framework for Queensland Health in subsequent years.

Percutaneous Device Closure of ASD

In most individuals, an intact interatrial septum is created during the embryologic development of the heart. In a significant proportion of the population communication between the right and left atria is covered by a flap of tissue but not sealed. This flap typically prevents interatrial blood flow from left to right, but not from right to left and this is known as a patent foramen ovale (PFO). Less commonly, an open communication persists between the atria after septation – an Atrial Septal Defect (ASD). The left atrium pressure is significantly higher than the right, causing a flow, or shunt, across the defect. Symptoms include dyspnoea, syncope, fatigue, oedema and palpitations.
Complications of a significant ASD include atrial arrhythmias, right ventricular failure, paradoxical embolism and stroke, cerebral abscess and pulmonary hypertension that becomes irreversible.

Percutaneous device closure of an atrial septal defect (PDCASD) is carried out in a cardiac catheterisation laboratory under general anaesthesia with transoesophageal echocardiography and fluoroscopic guidance. A guidewire and delivery sheath are passed through the defect via a femoral vein. An appropriately sized Amplatzer Septal Occluder (ASO) is then introduced and deployed across the defect. The ASO is wire mesh made out of nickel and titanium (Nitinol) and is filled with polyester fabric to help close the defect. The polyester fabric is securely sewn into the device with a polyester thread. The ASO has a specially designed delivery system that is used to attach, deliver and release it.

The Due Diligence conducted by the HTA Team identified two systematic reviews which found that percutaneous closure is safer than surgery for selected patients of all ages with fewer post-procedural complications experienced. These findings were confirmed by two comparative studies that focussed on the use of the ASO for adult patients. Percutaneous device closure was slightly less effective at achieving complete ASD closure compared to surgery. Problems encountered with the use of the ASO include ASDs that are too large for the device and residual shunt. Patients may experience a quicker return to normal activities.

This evidence enabled NQACT to support the establishment of a PDCASD service at The Townsville Hospital.

**Assessment type:** Due Diligence  
**Requested by:** QPACT  
**Purpose:** NTFEP Application

### Renal Denervation

The Medtronic Symplicity Renal Denervation System, also known as catheter-based radiofrequency sympathetic renal denervation (RDN), is designed to treat patients with resistant hypertension. Usual treatment for high blood pressure consists of lifestyle changes and a combination of antihypertensive medications. However, these interventions are insufficient to control blood pressure in approximately 20-30% of hypertensive patients. The central nervous system plays a role in the pathogenesis of hypertension – nerves in the renal artery communicate information between the kidney, brain, heart and blood vessels. Initial trials have shown that RDN can provide sustained improvements in office-based blood pressure for up to two years in patients with drug resistant hypertension. A catheter is inserted through the artery in the groin and delivers heat energy to the renal nerves, cutting communication lines with the brain, heart and blood vessels.
The catheter is connected to a proprietary, reusable generator which uses sophisticated control algorithms to automatically tailor radiofrequency energy delivery to the region being treated.

The Due Diligence identified a small number of clinical trials including a randomised controlled trial. They reported a substantial reduction in office-based blood pressure of at least -25/-10 mm Hg over 12-24 months. Ambulatory blood pressure had been measured for a small proportion of trial participants and shows lower reductions of -17/-7 mm Hg six months post-procedure. However, the author cautioned that long-term, overall health outcomes are unknown and require further research with longer follow-up periods.

QPACT approved funding for RDN under the 2011-12 round of the NTFEP. This is the first time the procedure has been undertaken in Queensland and the project is based at the Princess Alexandra Hospital. The integrated study is investigating a number of aspects unique to the existing evidence-base by treating approximately 60 patients over two years. The first patients were treated in December 2011 and the evaluation is ongoing.

**ROTEM**

**Assessment type:** Due Diligence  
**Requested by:** QPACT  
**Purpose:** NTFEP

ROTEM is a point of care (POC) test used to measure the viscoelastic properties on multiple aspects of blood coagulation in a sample of whole blood. The principle of ROTEM is related to classic thromboelastography (TEG) as both provide viscoelastic continuous profiles of blood clot formation adopting various assay compositions. The improved design of ROTEM allows its use as a mobile unit which can be transported easily to the operation theatre for POC coagulation management. The system has four independent channels which enable the performance of four independent tests at the same time. Unlike conventional clotting assays, ROTEM assesses the coagulation system as a dynamic process by determining not only the clotting time, but also the dynamics of clot formation, the mechanical clot stability and its lysis over time. Specifically, it provides information on particular aspects of coagulation including time to produce initial fibrin strands, time to develop clot, rate of fibrin build-up and cross linking, and maximum clot strength. By combining and comparing the results from different ROTEM tests, it is possible to identify singular or multiple coagulation factor deficiencies within a few minutes of obtaining samples and goal-directed coagulation therapy can therefore be readily initiated. Coupled with standard algorithms for coagulation management, the technology may be able to reduce bleeding and the transfusion of blood and blood products.

The Due Diligence found that ROTEM-guided coagulation management coupled with first-line therapy with specific coagulation factor concentrates showed a significantly reduced incidence of massive transfusion, surgical re-exploration and composite thrombotic/thromboembolic adverse events in a large observational study. However, the systematic review of RCTs did not find any
statistically significant difference in any of these outcomes. No significant benefits of using ROTEM-guided coagulation management, compared with SLTs and/or clinical judgement, in mortality and length of ICU or hospital stay were demonstrated in the literature. A reduced bleeding of 85mL was detected for ROTEM for cardiac surgery patients in the systematic review of RCTs, although, the clinical meaningfulness of this amount in the context of severe bleeding needs to be determined. A significantly reduced rate of combined allogeneic blood products transfusion was evident in the literature.

QPACT concluded that there is little data to prove that blood transfusions improve patient outcomes. The results of the Cochrane review demonstrate minimal effectiveness but ROTEM does reduce the amount of blood required, even though observational study has showed more promising results for ROTEM. There were concerns regarding whether this will assist in changing practice as there is currently not enough effectiveness data and RCT data is required. Metro North has subsequently funded a field evaluation of ROTEM / Multiplate Guided Transfusion in complex cardiac surgery through the Support, Explore, Excel and Deliver (SEED) Program to support better patient blood management. QPACT will continue to monitor the technology and take advantage of opportunities for improved patient blood management.

<table>
<thead>
<tr>
<th>Steroid Profiling</th>
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<tr>
<td><strong>Assessment type:</strong> Due Diligence</td>
</tr>
<tr>
<td><strong>Requested by:</strong> QPACT</td>
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<tr>
<td><strong>Purpose:</strong> NTFEP Application</td>
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</table>

Steroid profiling by Ultra Performance Liquid Chromatography – Mass Spectrometry (UPLC – MSMS) can be used in newborn screening for congenital adrenal hyperplasia (CAH). Its intended purpose is to use a sample from each neonatal screening card and analyse for steroid profiling using the UPLC-MSMS system, to ensure that infants with adrenal crisis are identified prior to such crisis – which is potentially fatal. It was proposed that every single newborn baby in Queensland would have this test – amounting to approximately 75 000 samples to be processed by the technology per year.

According to the literature, the sensitivity and specificity of the test is high. However, as CAH is a rare disease, the positive predictive value of adding UPLC-MS as a 2nd-tier test was around 10%. A large proportion of newborns will also be falsely classified as positive and undergo an unnecessary confirmatory test and intense clinical follow-up.

Pathology Queensland already uses UPLC-MSMS for steroid profiling to diagnose and monitor neonates with CAH. There are national requirements regarding the inclusion of this screening test into the Newborn Screening Program. This includes support from the Australian Health Ministers’ Advisory Committee (AHMAC) before the introduction of the test can be considered in each jurisdiction.

QPACT did not approve funding for the purchase of additional UPLC-MSMS equipment as it was considered outside the scope of QPACT to make recommendations on newborn screening programs. QPACT encouraged the applicants to make contact with AHMAC to communicate their interest in adding steroid profiling to the national Newborn Screen Program.
Stereotactic Radiosurgery

Several external beam radiation therapy (EBRT) techniques have emerged including image guided radiotherapy (IGRT), intensity modulated radiation therapy (IMRT) and SRS. SRS uses multiple intersecting beams of radiation to deliver a very high radiation dose to a precisely-defined area. The high dose of radiation is considered “surgical” as it effectively destroys cancerous tissue. SRS differs from radiation therapy in that it involves incrementally more accurate delivery of the planned dose to the tumour in one to five treatment sessions, as opposed to across 30 to 40 fractions, which can afford higher tumour response and local control. This curative effect is not always possible when the total dose is spread across numerous treatments. As a non-invasive approach, it eliminates the risk associated with surgical interventions while essentially achieving a surgical outcome. Precise targeting of the radiation to the correct tissue is a critically important aspect of radiosurgery.

The HTA Team identified a full HTA and a number of systematic reviews investigated the use of SRS for a number of intracranial conditions. They generally found that the addition of SRS to the treatment of brain metastases improved local tumour control but did not improve overall survival. The Technology Overview outlined a number of organisational factors that need to be considered with the purchase of such as high-cost, specialised piece of equipment such as sufficient dedicated staff and ensuring IT infrastructure can accommodate the additional data requirements.

The Radiation Oncology Department at the Princess Alexandra Hospital intends to upgrade existing linear accelerator (Linac) facilities with a navigation and planning system that enables SRS. The PAH will use the Technology Overview to inform its service planning and purchasing decisions.

Vibrant Soundbridge

The Vibrant Soundbridge (VSB) is a surgically implanted electronic device that aims to correct hearing loss through stimulation of the ossicular chain or middle ear. The device is placed in the middle ear and generally leaves the external auditory canal (EAC) open and unobstructed. The device is proposed for use in patients with sensorineural, conductive or mixed hearing losses. Middle ear implants are not indicated for people with profound hearing loss. All patients eligible for the VSB will have failed all appropriate conservative therapies, including an optimally-fitted external hearing aid.

While the Vibrant Soundbridge is relatively new to the Australian market (receiving TGA approval in 2009), the device has been used in the United States and Europe for approximately 10-12 years. The device will only be used for a small number of children per year – approximately 6-8. The Due Diligence found there is limited comparative evidence on the safety and effectiveness of the VSB for children. While a consensus statement on the use of the VSB has been developed by an international expert committee, longer-term studies on the device are warranted in children.
QPACT did not approve funding for the technology from the NTFEP due to the lack of comparative evidence on safety and effectiveness. QPACT will continue to monitor the technology as new evidence emerges.

Field Evaluations

The HTA team continues to coordinate ongoing field evaluations for technologies funded under current and previous rounds of the NTFEP. These evaluations are in the process of implementing technologies for piloting, collecting data on organisational barriers and clinical outcomes, and will provide final evaluation reports used to guide decisions on the future adoption of the technologies in Queensland. Additional details can be found in Appendix 1.

- BioNESS L300 foot drop system for acute stroke patients
- Ensite Velocity Electroanatomic Mapping System for abnormal heart arrhythmia
- Ex-Vivo Lung Perfusion System to recondition marginal donor lungs
- GeneXpert for the detection of tuberculosis and rifampicin resistance
- GreenLight Laser Therapy for benign prostatic hyperplasia
- Inreach Electromagnetic Navigation to detect lung lesions
- Laser Lead Extraction to aid the removal of chronically implanted pacemaker and defibrillator leads
- Monoplace Recompression Chamber to administer hyperbaric oxygen therapy
- NxStage Home Haemodialysis for end stage kidney disease
- Pharmacy Robotics for the automation of medication dispensing
- Renal Denervation for resistant hypertension
- Volumetric Modulated Arc Therapy (radiation therapy) for various cancers

Events

HTA Workshop: Innovation and Return on Investment

On 2 May 2012, the Health Technology Assessment Team hosted a workshop entitled “Innovation and Return on Investment”. The workshop provided an opportunity for clinicians, health planners and administrators to share in the experiences of a wide range of national and international speakers with expertise in HTA and the healthcare industry. Chris Farr, who is a key member of international healthcare consultancy Sg2’s diagnostics and international team, facilitated the workshop. Chris has more than 25 years of experience in medical imaging and radiation therapy and has shared his knowledge of these technologies with clients in the US, the United Kingdom, Australia, Hong Kong, Singapore, Thailand, Malaysia, the United Arab Emirates and Qatar. Sessions, which included presentations and interactive activities, were provided on:

- Health Technology Assessment: A Global Perspective
• Health Technology Assessment: An Australian Perspective – Professor Janet Hiller, Associate Dean (Research) and Professor of Public Health, Faculty of Sciences, Australian Catholic University
• An Industry Perspective on Health Technology Assessment – David Brown, Operations Manager, Siemens Ltd Australia and New Zealand
• Interpreting Clinical Evidence – Linda Mundy, Manager, Health Policy and Advisory Committee on Technology (HealthPACT), Queensland Health
• Activity Based Funding and Adopting New Health Technologies – Professor Stephen Duckett, Casemix Consulting
• The Economic Value of an Independent Health Technology Assessment Program – Kaye Hewson, Manager, HTA Team and Paul Crosland, A/Principal Policy Officer, HTA Team
• Panel Exercise: Whether to Introduce CyberKnife into a Hospital Setting

The objectives of the workshop were to:

• Explore the concept of innovation
• Consider how HTA should respond to the growing demand for innovative technologies with limited resources
• Consider what constitutes a good assessment of a new technology
• Consider the relationship between government, the hospital and industry in HTA and how to demonstrate the value of HTA in Queensland.

A panel exercise was conducted to consider the hypothetical scenario of whether the CyberKnife Robotic Radiosurgery System should be adopted in a public health service in Queensland to demonstrate the sort of issues that need to be considered in an assessment that informs a purchasing decision. This was a hypothetical case example only.

The HTA Team received positive feedback on the usefulness and relevance of the day to clinical practice and the future of the health system in Queensland.

HTAi Conference 2012: Bilbao

From 23-27 June 2012, Bilbao in the Basque Country in north eastern Spain hosted the 9th Meeting of HTAi (Health Technology Assessment International). As healthcare systems around the world are facing challenges, such as multiple entry points, inappropriate use of costly and scarce resources, waiting lists, and poor communication of information between institutions and health care practitioners, new technological solutions are an avenue to address these issues.

The theme of the conference was the concept of ‘integrated care’. New technological solutions are being developed parallel to integrated health care to respond to issues such as the growing elderly population and increase in chronic disease. This is putting increased pressure on institutions and health care practitioners to provide medical care in the most cost-effective way.
The HTA Program Queensland showcased some of the projects and work being undertaken including:

- “Improving patient and medication compliance in Indigenous Australian communities in far North Queensland, Australia”
- “Mapping health technologies against burden of disease – a better way to plan for health systems”
- “Health Technology Assessment and Organisational Feasibility: challenges from Pharmacy Automation”
- “Health Technology Assessment and Evidence-Based Policy Making: The Queensland Experience”

Collaboration

The HTA Team has regular consultation with the following stakeholders within and outside of Queensland Health to ensure its assessments account for alternative perspectives and contain the latest, independent, expert advice.

- Clinical Access and Redesign Unit and other branches within the Health Service and Clinical Innovation Division
- Biomedical Technology Services
- Furniture, Fittings and Equipment (FF&E) Strategic Working Group
- Hospital and Health Services
- Health Technology Equipment and Replacement (HTER) Program, Capital Acquisition Program
- Health Policy and Advisory Committee on Technology (HealthPACT)
- Major Hospitals Projects and Capital Delivery Program, Health Infrastructure and Planning Division
- National Health Committee, New Zealand
- Sunshine Coast University Hospital redevelopment project
- Victorian Policy Advisory Committee on Technology
- Western Australian Policy Advisory Committee on Clinical Practice and Technology (WAPACT)

Summary

Within finite resources, choices must be made regarding the deployment of resources and the purchasing, implementation and evaluation of new medical technology. The HTA Program will be part of this System Manager role by assessing, implementing and evaluating new health technology in Queensland’s public health sector. The Program will continue to provide evidence-based advice to
assist the Hospital and Health Services in clinical decision-making on the purchase and uptake of new technology and ultimately ensure the safety and quality of health services within Queensland.

In 2011-2012, the HTA Program has successfully overseen the implementation and evaluation of new health technologies in the public health sector. QPACT will continue to look at ways of assisting HHSs to evaluate technologies and identify those that could have state-wide application.

QPACT will continue to play a critical role during the health reform process to ensure the evidence-based adoption of cost-effective innovation. This will include a greater role in determining the requirements for an evaluation of a new technology supported for funding (which has traditionally been completed by lead clinical applicant/s) and of monitoring technologies that do not yet have the clinical evidence to warrant diffusion.
### Appendix 1

Update on technologies funded under the New Technology Funding Evaluation Program (NTFEP): 2009-2012

<table>
<thead>
<tr>
<th>Technology and intended purpose</th>
<th>Queensland Health Facility</th>
<th>Funding year</th>
<th>Progress to date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pharmacy automation</strong> within the dispensary and pharmacy storeroom</td>
<td>Princess Alexandra Hospital (PAH)</td>
<td>2009-2010</td>
<td>End of project report completed – contact the HTA secretariat for further details (<a href="mailto:secretariat_hta@health.qld.gov.au">secretariat_hta@health.qld.gov.au</a>)</td>
</tr>
<tr>
<td><strong>Greenlight laser therapy</strong> to treat benign prostatic hyperplasia</td>
<td>QEII Hospital, Nambour Hospital and The Townsville Hospital</td>
<td>2009-2010</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date (including economic analysis) August 2012</td>
</tr>
<tr>
<td>Inreach Electromagnetic Navigation Bronchoscopy to detect lung lesions</td>
<td>The Prince Charles Hospital (TPCH)</td>
<td>2009-2010</td>
<td>End of project report completed – contact the HTA secretariat for further details (<a href="mailto:secretariat_hta@health.qld.gov.au">secretariat_hta@health.qld.gov.au</a>)</td>
</tr>
<tr>
<td><strong>High end breast Magnetic Resonance Imaging (MRI)</strong> to allow faster and more detailed examinations. It will also allow diagnostic and biopsy use, with a dedicated workstation and computer-aided detection software to improve processing and examinations</td>
<td>Royal Brisbane and Women’s Hospital</td>
<td>2010-2011</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date June 2012</td>
</tr>
<tr>
<td><strong>Volumetric Modulated Arc Therapy (VMAT)</strong> - new radiation therapy technique</td>
<td>Princess Alexandra Hospital</td>
<td>2010-2011</td>
<td>First quarterly report submitted to the HTA secretariat. To date the following indications have been treated: cancer of the prostate, upper arm, cervical vertebrae, upper oesophagus/thyroid. Anticipated project end date October 2012</td>
</tr>
<tr>
<td><strong>Ensite Velocity Electroanatomic Mapping System</strong> to map abnormal heart arrhythmias, record electrical information from the heart which will</td>
<td>Princess Alexandra Hospital</td>
<td>2010-2011</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date June 2012</td>
</tr>
<tr>
<td>Project Description</td>
<td>Location</td>
<td>Start/End Date</td>
<td>Status and Details</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
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<tr>
<td><strong>Mirrijini Kiosks</strong> - combined touch-screen pharmacy dispensing system and blister-pak system to increase medication dispensing accuracy and medication compliance</td>
<td>Cape York Health Service District</td>
<td>2010-2011</td>
<td>End of project report completed - contact the HTA secretariat for further details (<a href="mailto:secretariat_hta@health.qld.gov.au">secretariat_hta@health.qld.gov.au</a>)</td>
</tr>
<tr>
<td><strong>Monoplace Recompression Chamber</strong> to administer hyperbaric oxygen therapy</td>
<td>Royal Brisbane and Women’s Hospital</td>
<td>2011-2012</td>
<td>Equipment received; evaluation to commence in the last quarter of 2012.</td>
</tr>
<tr>
<td><strong>BioNESS L300 foot drop system</strong> to support functional gait in acute and sub-acute stroke patients who demonstrate foot drop as a result of first time stroke</td>
<td>Rural Stroke Outreach Service (Royal Brisbane and Women’s Hospital, Gold Coast Hospital, The Townsville Hospital and Ipswich Hospital)</td>
<td>2011-2012</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date January 2013</td>
</tr>
<tr>
<td><strong>EX-VIVO lung perfusion system</strong> to recondition nonviable or marginal donor lungs to enhance overall numbers of lung transplant operations in Queensland each year</td>
<td>The Prince Charles Hospital</td>
<td>2011-2012</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date January 2013</td>
</tr>
<tr>
<td><strong>Laser lead extraction</strong> to aid in the removal of chronically implanted pacemaker and defibrillator leads</td>
<td>The Prince Charles Hospital</td>
<td>2011-2012</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date September 2012</td>
</tr>
<tr>
<td><strong>GeneXpert MTB/RIF</strong> for simultaneous detection of <em>M. tuberculosis</em> complex and resistance to rifampicin from sputum samples</td>
<td>Queensland Mycobacterium Reference Laboratory, Royal Brisbane and Women’s Hospital</td>
<td>2011-2012</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date February 2013</td>
</tr>
<tr>
<td><strong>Fibroscan</strong> for the detection of liver fibrosis and management of chronic</td>
<td>Royal Brisbane and Women’s Hospital and Princess Alexandra</td>
<td>2011-2012</td>
<td>Quarterly reports being submitted to the HTA secretariat. Anticipated project end date June 2012</td>
</tr>
</tbody>
</table>
**HTAs commissioned by QPACT**

<table>
<thead>
<tr>
<th>HTA topic (includes a systematic review and economic evaluation)</th>
<th>Intended purpose</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comprehensive epilepsy service</strong></td>
<td>Patients with refractory epilepsy in the context of a comprehensive epilepsy service model</td>
<td>Epilepsy surgery offers an effective &amp; cost-effective treatment modality for patients with medically refractory epilepsy to improve seizure control and quality of life for patients. However, pre-surgical evaluation by a multidisciplinary team is critical to select suitable candidates. It is appropriate that an epilepsy surgery program be established for Queensland patients with medically refractory epilepsy. At the initial stage of setting up the service, a single epilepsy surgery centre is recommended to maintain both expertise in the centre and the quality and safety of the program.</td>
</tr>
<tr>
<td><strong>Obesity management service</strong></td>
<td>Delivery of bariatric surgery within a framework of a multidisciplinary model of care for adults and children</td>
<td>Bariatric surgery is a safe, highly effective and cost-effective therapeutic option for patients with clinically severe obesity. The target population for bariatric surgery are morbidly obese individuals that meet the following conditions: adults aged less than 45 years of age with a body mass index &gt;45kg/m² and comorbidities; and adolescents over the age of 15 years with an age-related BMI over the 95th percentile or body mass index &gt; 35 kg/m² in the presence of severe obesity-associated complications.</td>
</tr>
</tbody>
</table>

| **NxStage home haemodialysis machines** for patients with end stage renal failure (ESRF) requiring haemodialysis | Princess Alexandra Hospital and Cairns Base Hospital | 2011-2012 | Quarterly reports being submitted to the HTA team. Anticipated project end date February 2013 |
| **Renal denervation** to treat patients with resistant hypertension | Princess Alexandra Hospital | 2011-2012 | Quarterly reports being submitted to the HTA team. Anticipated project end date June 2013 |
## Appendix 2

Technologies reviewed by District Advisory Committees on new Technology in 2011-2012

<table>
<thead>
<tr>
<th>Technology and intended purpose</th>
<th>Committee</th>
<th>Type of work</th>
<th>Advice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stereotactic radiosurgery for intracranial stereotactic treatments</strong> – brain metastasis, base of skull tumours (acoustic neuroma and meningioma), pituitary adenoma and a small number of inoperable ateriovenous malformations.</td>
<td>SQACT</td>
<td>Due diligence</td>
<td>Pending</td>
</tr>
<tr>
<td>Intervapor for Chronic Obstructive Pulmonary Disease</td>
<td>MNCQACT</td>
<td>Rapid evidence scan</td>
<td>Pending</td>
</tr>
<tr>
<td><strong>Rotational Thromboelastometry (ROTEM)</strong> for measuring multiple aspects of blood coagulation in a sample of whole blood. Specifically, it provides information on hyperfibrinolysis, the extent of dilutional coagulopathy, the requirement for either fibrinogen or platelet substitution, and heparin and protamine dosage monitoring.</td>
<td>QPACT</td>
<td>Technology overview</td>
<td>Current evidence shows that ROTEM improves the management of transfusion, however its benefits on clinical-relevant outcomes are yet to be confirmed.</td>
</tr>
<tr>
<td><strong>O-arm System</strong> for 2D and 3D Intraoperative Surgical Imaging for patients requiring spinal surgery</td>
<td>GCACT</td>
<td>Technology Overview</td>
<td>While the clinical literature appears promising, there is limited clinical experience to date with the technique and data examining its accuracy.</td>
</tr>
<tr>
<td><strong>Vibrant Soundbridge Ear Implants</strong> for children with conductive sensorineural or mixed hearing losses</td>
<td>QPACT &amp; PaedACT</td>
<td>Due diligence</td>
<td>There is limited clinical evidence on the safety and effectiveness of these ear implants in children.</td>
</tr>
<tr>
<td><strong>3D ultrasound</strong> for radiation therapy planning</td>
<td>SQACT</td>
<td>Technology overview</td>
<td>The 3D ultrasound for radiation therapy planning is still in its infancy and should be monitored over 12 months</td>
</tr>
<tr>
<td><strong>Flex Focus Ultrasound</strong> to 1) detect and prevent, by ultrasound, the incidence of perineal trauma in intact perineum 2) enable early diagnosis of perineal trauma and early and effective patient management</td>
<td>QPACT &amp; NQACT</td>
<td>Due diligence</td>
<td>The technology has good diagnostic accuracy for symptomatic women, however there are concerns regarding the low predictive value of ultrasound for faecal incontinence, indicating primary injury does not necessarily cause symptoms. This has been confirmed in</td>
</tr>
</tbody>
</table>
the literature due to the multi-factual mechanism for faecal incontinence. There were also concerns regarding the proposed model of care (including the target population).

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Agency</th>
<th>Process</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percutaneous device closure of atrial septal defect (PCASD)</td>
<td>NQACT</td>
<td>Due diligence</td>
<td>PCASD is considered safer than surgery in selected patients with fewer post procedural complications experienced. Requires less resource use than surgery due to the less invasive nature of the procedure and significantly reduced length of hospital stay.</td>
</tr>
</tbody>
</table>
| Donor human milk in the context of the establishment of a Human Milk Bank | NQACT  | Due diligence | • There is evidence on the association of donor human milk, compared with formula milk, and the lower risk of necrotising enterocolitis (NEC) for premature neonates (less than 32 weeks). However there is no long-term outcome available. The establishment of Human Milk Bank required careful planning and consideration of organisational and regulatory requirements.  
• There is relatively low incidence of NEC among neonates: 1.6%  
• There are significant costs in setting up the service, the space and infrastructure needed, the distribution, the donar management etc. 2) the long-term benefits of setting up such a service is not clear, 3) a cost-benefit analysis for life-year saved, taking into consideration of opportunity cost, need to be determined, and 4) the logistics of setting up the service will be difficult. |