Cost and outcomes study for NSW Health

The Independent Pricing and Regulatory Tribunal of NSW (IPART) has reviewed the costs, clinical practice and outcomes in 5 major NSW hospitals. The review included a detailed examination of 11 clinical case study areas. This fact sheet provides a summary of IPART’s review. The full report and 11 case study reports are available on IPART’s website (http://www.ipart.nsw.gov.au).

Overview

During 2009/10 IPART undertook a review for NSW Health of 5 selected NSW hospitals. The IPART review is part of a wider review by NSW Health. The next 2 steps of the wider review will involve clinical experts considering our findings, to determine whether variations in clinical practice or clinical outcomes warrant further research, investigation or action.

The 5 hospitals were Royal Prince Alfred Hospital (RPAH), Gosford Hospital (GH), Royal North Shore Hospital (RNSH), Bankstown-Lidcombe Hospital (BLH) and John Hunter Hospital (JHH).

We undertook analysis at two levels:

- at the hospital-wide level, and
- using 11 clinical case studies (see Appendix A).

At the hospital-wide level we compared the financial management, clinical costing, and clinical coding practices at the study hospitals. We also compared the approaches these hospitals used to manage and control the costs associated with the use of selected clinical resources involved in providing patient care. These resources were nursing staff, medical staff, prostheses, imaging, pathology, pharmacy, and operating theatres.

At the detailed case study level, we selected 11 specific clinical conditions or procedures to investigate groups of similar patients to compare similar hospital activities. Generally we looked at:

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1 We have also included the Institute of Rheumatology and Orthopaedics (IRO), a specialised orthopaedic surgery centre attached to RPAH, as part of our consideration of costs, outcomes and in particular, our analysis of the hip joint replacement case study. This facility undertakes the majority of planned hip procedures and shares medical staff and clinical resources with RPAH.
- patient numbers
- lengths of stay
- selected costs
- how care is configured
- safety, quality and outcome indicators.

IPART was assisted by a clinical consultant and a Clinical Reference Group. IPART also consulted a wide range of clinicians and other staff at the study hospitals and health experts from the Agency for Clinical Innovation, the Clinical Excellence Commission, and the Bureau of Health Information.

**Purpose of Study**

Our primary objective was to produce a body of information and analysis on costs, clinical practice and outcomes that can be used by clinical experts and hospital administrators to promote clinical best practice and efficiency. Our study highlights variations in the way hospitals manage and provide care and compares costs and indicators of clinical outcomes. As part of the study we also aimed to:

- develop the basis for a methodology for comparing hospital costs, care and outcomes that can be applied more widely
- gain a better understanding of the current accuracy and consistency of clinical cost estimates and clinical coding, and the reliability of the information provided to the National Hospital Cost Data Collection
- identify ways in which the significant amount of data NSW hospitals currently collect can be better used by the health system, hospitals, clinical units and individual clinicians to improve clinical practice or reduce costs.

**Our main findings**

We identified some of the challenges of comparing hospitals on a like-with-like basis that will be faced by the new Independent Hospital Pricing Authority in establishing a national efficient price for hospital services. We also indicated ways that NSW Health could continue to improve the consistency of its hospital datasets.

**Use of Diagnosis Related Groups (DRGs) for comparing costs in different hospitals**

Studies that compare or benchmark hospital performance often use cost or activity measures based on Diagnosis Related Groups (DRGs) as the basis for comparison. DRGs are intended to classify patients into groups with similar clinical conditions and similar resource requirements. We found that there were limitations in the use of DRGs for comparing hospitals’ costs or outcomes for certain clinical areas, particularly where certain hospitals specialise in the care of specific types of cases.
Box 1  Hip joint replacement example

As part of our hip joint replacement case study, we ‘drilled’ within the DRG groupings based on the patients’ principal diagnosis codes. We then compared costs and outcomes. We found that there were two main subgroups of patients – those with a principal diagnosis of arthritis and those with a principal diagnosis of hip fracture.

On average, the arthritis patients were in their 60s, had shorter stays in hospital, had lower rehabilitation costs and lower use of imaging tests, pathology tests and required less blood. The mortality rate for this group was very low.

The hip fracture patients were in their 80s, had much longer hospital stays, generally had a need for rehabilitation and had higher costs for imaging, pathology and blood use. The mortality rate for this group was higher.

We found that one of the hospitals specialised in care for arthritis patients while another specialised in the care of more complex cases. A simple comparison of the average lengths of stay or average costs of these two facilities would indicate that the facility that specialises in arthritis is more efficient. However, the two hospitals are clearly different and it would be misleading to compare costs of the two hospitals for the same DRG groupings.

Consistency of patient classification and numbers

We found that there was a need for greater consistency in the way hospitals classify their patients, particularly between inpatients and outpatients. Some patient information is held locally by hospital clinical units (such as eye clinics and cardiac catheter labs).

Consistency of lengths of stay

For length of stay, we calculated the average length of stay for each patient group using 3 different measures, and identified the measure that provided the most consistent basis for comparison. The measures included:

- episode length of stay in study hospitals (LOS1)
- total length of stay in study hospitals (LOS2), and
- total length of stay in study hospitals plus up to 2 other hospitals (1 transfer in and 1 transfer out) (LOS3).
We found that although the acute episode (LOS1) is widely used as a basis for comparing hospital costs, it was not a consistent basis for comparing the study hospitals for all patient groups. This was because the hospitals had different practices in relation to changing patients’ ‘care type’ codes during their stay (eg, from an acute care episode to a rehabilitation care episode). Therefore, apparent differences in average lengths of stay across hospitals may simply reflect differences in these practices.

**Box 2 Comparisons of lengths of stay - Stroke case study example**

Stroke patients at one hospital received a significant amount of rehabilitation in the wards, while at other hospitals, patients were transferred to a specific rehabilitation facility at a separate site.

This meant that at first glance, stroke patients at this hospital seemed to have far longer lengths of stays than patients in other hospitals, which would potentially imply inefficient practice, where in fact this is solely due to a difference in the measurement of length of stay for rehabilitation patients.

**Coding**

Clinical coding is the classification process whereby patients are assigned a DRG and other codes based on information in their medical records about their diagnoses, the procedures they have undergone, and various demographic and administrative factors. We undertook analysis to assess the accuracy and consistency of the study hospitals’ coding practices.

Our findings suggested that NSW hospitals need to consider their coding accuracy. This is particularly important in light of the introduction of activity-based funding, since coding accuracy will impact on reported casemix complexity and this is likely to have funding implications in a casemix or activity-based funding system.

**Clinical costing**

Clinical costing involves allocating hospital expenditures to specific groups of patients (eg, based on their DRGs) to estimate the costs of providing their hospital care. We found that hospitals used a range of approaches for clinical costing and there was scope to improve the quality and consistency of clinical costing data.

We recommended that the NSW Department of Health works with the area health services and hospitals to apply a consistent set of rules for clinical costing covering cost centres and inpatient fractions (IFRACs) so that data are consistent and comparable between the hospitals.
We also suggested that the costing data should be available to enable comparative analysis on clinical practices and performance.

**Staffing**

We compared nursing staff costs at the hospital level and the case study level. We found broad similarities in nursing costs and the profile of nursing seniority.

We found there was little variation in the ratio of expenditure on junior to senior medical staff (including VMOs) across the five study hospitals. There was also little variation in the average hourly pay of junior medical staff, and only moderate variation in the average hourly pay of staff specialists. We found significant variation in VMO costs as a proportion of total medical staff costs across the hospitals, ranging from 16% at JHH to 41% at GH.

Medical staff costs were very difficult to compare at the case study level due to inconsistencies in the information available.

**Prosthesis costs**

We examined the approaches of the selected hospitals to the purchase of prostheses, with more detailed analysis of the following five prosthetic devices - coronary stents, pacemakers, implantable cardioverter defibrillators, lenses and hip joints.

We found that:
- each hospital had a different approach to prosthesis purchasing, ranging from structured through to less controlled approaches
- there was substantial variation in the range of prostheses purchased across hospitals
- there was significant variation in the price paid for the same item across hospitals.

We found that there was scope for the study hospitals to pay lower prices for commonly purchased prosthesis items and for several of the hospitals to adopt more rigorous prostheses management practices. For example, this could be facilitated through:
- price controls such as use of threshold pricing policy or tendering
- sharing purchase prices across hospitals
- use of dedicated business managers for purchasing.

Bankstown-Lidcombe Hospital, RPAH and John Hunter Hospital were identified as having better practice models for prosthesis procurement of the five study hospitals.
We noted variations in hospitals’ choice of some prosthesis items (such as stents) could have clinical implications and that clinical experts should consider these variations.

**Imaging and pathology costs**

Our findings on imaging costs suggested that there was variation in the use of imaging and pathology among study hospitals for similar conditions as well as differences in the controls used to manage imaging and pathology use. We suggested ways that imaging and pathology data could be used more effectively to improve clinical practice and cost management.

**Operating theatre costs**

Our findings highlighted differences in theatre capacity, but also differences in theatre management practices among study hospitals. We noted that average operating times for the same procedures varied, however, this can be due to a number of factors including differences in case types, case complexity or surgeon preference. We identified examples of better management practices that should be considered for implementation in other hospitals or hospital networks.

We found that:

- hospitals that separated planned surgery from emergency surgery generally had more efficient and effective theatre management, and this may also reduce length of stay, particularly for planned surgery, such as for patients with a principal diagnosis of arthritis in the hip replacement case study

- rostered specialist surgeons providing care for emergency surgical admissions may reduce length of stay for emergency cholecystectomy (gall bladder surgery) cases, and

- limits on theatre availability, inflexible start and finish times and limited after hours access to diagnostic tests can hinder efficient patient flow.

Our findings also pointed to shortcomings in the quality of theatre data and we considered that the NSW Health should establish a standard approach to the measurement of recorded theatre times and undertake audits of the quality of data.

**Clinical variation in configurations of care**

Extensive international evidence indicates that there is clinical variation in medical and hospital practices. We were asked to explore configurations of care as part of our study. The term ‘configurations of care’ refers to the way that hospitals choose to manage and provide patient care, including their clinical practices.
We identified a range of differences in the configurations of care provided at the study hospitals in our case study areas, which may help to explain differences in the costs and outcomes of care across those hospitals. We asked that NSW Health arranges for appropriate clinical expert groups to consider the following clinical issues identified in our case studies; and that where appropriate, NSW Health and the expert groups take steps to address clinical differences.

We identified clinical variation in the following areas:

- the relative use of drug-eluting stents compared to bare-metal stents for interventional cardiology procedures
- the percentage of cholecystectomies (gall bladder surgery) performed acutely as emergency admissions (ranging from 16% - 50%)
- the average length of stay for lung cancer surgery (ranging from 7 to 16 days LOS3) influenced by factors including the pre-admission processes, use of ICU staff and timing of chest drainage after surgery
- the use of day surgery compared to overnight surgery for some planned procedures, including stenting and hysterectomy
- the rate of transfer of suspected stroke patients to stroke units, influenced by factors including whether the hospital had protocols with NSW Ambulance Service for stroke patients and how the ED worked with the Stroke Unit. This has implications for the effective use of tPA (clot dissolving medication).
- the discharge support policies and post surgery models of care and therefore length of stay for mastectomy patients, influenced by the use of APAC services and community care options.
- the birthing options provided, including the length of stay for those using early discharge programs
- the use of imaging for the diagnosis of appendicitis
- the use of fluoroscopy imaging for cholecystectomy procedures, and
- the rates of laparoscopic surgery compared to open surgery for appendicectomy.

**Patient outcomes**

Overall, there were few differences in risk-adjusted outcome indicators. Where we observed apparent differences among hospitals, these have been referred to clinical expert groups.

We found differences in unplanned readmission rates and wound infection rates for selected surgical procedures at hospital and case study levels, however we concluded that outcome indicators, such as mortality, survival, unplanned readmission and wound infection rates, were more meaningful when set, measured and monitored at the clinical level, rather than the hospital-wide level.
We suggested that there should be further clinical review of outcome indicators in the following case study areas: major chest surgery, hip joint replacement, appendicectomy, cholecystectomy, obstetric delivery and caesarean rates.

**Improving data quality**

We identified scope to improve data quality in areas such as operating theatre data, medical records and clinical coding. We suggested that this could be improved by:

- encouraging more consistent coding of co-morbidities and auditing of the quality of data eg, clinical coding and returns to theatre
- facilitating ways to streamline access to data held by third parties, subject to privacy issues
- regular dissemination of outcome information to hospital management and clinicians
- appropriate resourcing to support data collection.

**Quality of data on outcome indicators**

We also suggested ways to improve the quality of hospital outcome indicators, while noting that a number of current Commonwealth and State initiatives will improve this data. We recommended that NSW Health should:

- enhance its understanding and use of outcome indicators, such as mortality rates, survival rates, unplanned readmissions to hospital and wound infection rates and their risk adjustment
- continue to contribute to the development of Australian Council on Safety and Quality in Health Care’s (ACSQHC) safety and quality standards for these indicators
- refine the methodology used for standardising or risk-adjusting these indicators
- continue to consult with clinicians regarding the agreed presentation of mortality, survival, unplanned readmission and wound infection information
- report this information on a more routine and regular basis consistent with ACSQHC data sets
- encourage hospitals to put in place systems to facilitate accurate coding of comorbidities
- negotiate more streamlined arrangements for access to data held by third parties (such as clinical registries) for clinical analysis, and make data available to hospitals and clinicians
- provide outcomes information to clinicians in a more systematic way as an aid to clinical improvement and a key indicator of performance.
A  Clinical case study areas

Clinical case study areas

To compare costs, configurations of care and outcomes in the 5 study hospitals, we undertook detailed analysis on 11 specific clinical conditions or procedures (as well as undertaking broad, hospital-wide analysis). These conditions/procedures included:

1. Hip joint replacement
2. Major chest procedures
3. Breast surgery
4. Cholecystectomy (gallbladder surgery)
5. Appendicectomy
6. Stroke
7. Cardiology
8. Tracheostomy or ventilation for greater than 95 hours
9. Cataract/lens procedures
10. Hysterectomy
11. Obstetrics delivery.