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**An Economic Analysis of the use of Nurse-led
Clinics for Patients with low-risk urological
cancer.**

**Study based upon a Western Central Melbourne Integrated Cancer Services
(WCMICS) supported project in 2016/17
at St.Vincent's Hospital, Melbourne (SVH) and Goulburn Valley Health (GVH)**

Lead researcher: Ian Dennis, FACS, FAIM, FAICD

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Background to the Project



In March 2016, a project was established, with support from Western Central Melbourne Integrated Cancer Services, with the task of improving follow-up care for patients with low-risk urological cancers. The project aimed to improve follow-up care for patients with low risk urological cancers and enhance productivity of the Urology units at St Vincent's Hospital (SVH) and Goulburn Valley Health (GVH). This will include transitioning patients back to community care with improved clinical handover and communication with General Practice. This was to be achieved through trialling the provision of Nurse-led clinics supported by (partially) automated tailored patient care-plans, and coordinated services provided by the patient's GP, rather than more routine appointments with urologists and/or other specialists. A Project Working Group was formed to provide input and advice on project processes, resources and strategies, and to provide support, guidance and advice on the planning, implementation and evaluation of the project.

Project Working Group Membership

Ming Wong (Chair)	Project Lead / Urologist, SVH & GVH
Anne Robinson	Divisional Operations Director, GVH
Belinda Smith	General Manager of Specialty Services SVH
Elizabeth Johnson	Tumour Stream Manager, Victorian Comprehensive Cancer Centre
Fiona Healy	Nurse Unit Manager, Specialist Clinics, SVH
Ian Dennis	Consumer Representative
Jane Crowe	GP Representative
Jeremy Goad	Director of Urology, SVH
Jon Emery	Herman Professor of Primary Care Cancer Research, University of Melbourne
Lesia Stewart	Program Manager, Cancer Services, SVH
Mia Percy	Urology Nurse, SVH
Molly Trethewey	Urology Nurse, SVH
Michael Barton	Project Officer, Western & Central Melbourne Integrated Cancer Service
Sita Vij	GP Liaison Coordinator, SVH
Sonia Strachan	Urology Nurse, GVH

The clinical and patient outcomes of the project are reported on through WCMICS. As consumer representative, Ian Dennis offered the services of the Pearcey Institute to the Project to conduct an independent analysis of generic economic benefits that might accrue from the adoption of the nurse-led clinic "shared-care" approach and the use of IT supported care-plans.

Disclaimer

This report therefore represents the Pearcey Institute analysis alone, and is not necessarily representative of the viewpoint of WCMICS, St. Vincent's Hospital, Goulburn Valley Health, or of any individual member of the Project Group.

Methodology

In order to ensure that this economic review has a wider relevance, it was decided that, rather than basing economic analysis on the specific costs relevant to the two trial sites (St. Vincent's and Goulburn Valley Health), that a cost base with relevance throughout Australia be used.

Accordingly data was obtained from the Australian Tax Office on the latest available (2013-14) actual pre-tax income for over 300,000 individuals at various grades of health professional relevant to this study.

Taxation statistics 2013–14 Individuals: Selected items, by occupation, gender and taxable income, 2013–14 income year

Occupation ¹	No of tax returns	Average gross income
2535 Surgeons	3688	\$521,002.21
2531 Generalist Medical Practitioners	27691	\$181,653.45
2543 Nurse Managers	4098	\$99,202.44
2544 Registered Nurses	288000	\$66,442.56

Estimates were then made of the impact on the costs of “deliverable hours”¹ of statutory superannuation and the normal associated wage costs common to all employment, in order to arrive at a median cost per hour for each grade of health professional, that could be used together with time allocations to calculate likely costs for the personnel cost of patient services within the study, and their alternates. Allowance has also been made for the impact on working hours of statutory annual leave, but no provision has been made for anomalies related to shift loadings etc., as it is assumed that the impact of these variations have been incorporated into median actual gross salaries received and reported in tax returns.

No provision has been made for any variation by speciality (e.g. oncologist v urologist), as this data was not available.

It was also assumed, for the purpose of the exercise, that accommodation and equipment costs would not be likely to have varied significantly regardless of who was providing such services, so any variation in facilities relevant to the patient services have been ignored.

Based upon this assessment the estimated median cost (to the health system) per hour for personnel is shown below. All calculations following are based on current cost, with no allowance for inflation or cost variation.

Occupation ²	Estimated cost per hour
2535 Surgeons	\$408.58
2531 Generalist Medical Practitioners	\$142.46
2543 Nurse Managers	\$77.80
2544 Registered Nurses	\$52.11

¹ Actual hours available to work during the normal working year

² ANZSCO level 4

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Discussions were held with practitioners conducting the nurse-led clinics, and other experienced personnel, to determine average consultation and preparation/admin/conclusion times relevant to this assessment.

From this it was determined that, whilst a consultant urologist might spend an average of 15 minutes per consultation, with a similar time spent reading and writing clinical notes, a nurse-led clinic was more likely to expend 40 minutes on the consultation with between 30 minutes and an hour on preparatory work to develop the care-plan, with the variation primarily dependant on the level to which the care-plan could be produced automatically from existing data-bases.

Proof of Concept

The project did not have adequate funds to provide a full test of care-plan automation. Accordingly a “proof-of-concept” approach was taken to produce MSWord based partially populated care-plans from the St. Vincent’s IMDT system. These were then to be populated with additional data by the nurse prior to the clinic.

Variation in the quality and quantity of the patient data held in the originating system was identified during the trial. This has been coupled with some minor difficulties in formatting the resultant word documents, (partially occasioned by the use of a “generic” care-plan in the test approach, rather than a “tumour-specific” approach with tailored data formats that would be more logical in an operational process).

The net effect has been that, during this trial, the amount of data needing to be added, together with adjustments for formatting problem during this process, has meant that the time saving has been negated, and it has in the opinion of the senior staff concerned been more efficient to create the care-plan document instead from a blank MSWord template, rather than to use the computer produced care-plans for the trial.

Based upon the efficacy of those data-rich care-plans requiring little or no additional data, it is estimated that a saving of 20 minutes per consultation, from the current 40 minutes, could be achieved should a fully operational, properly populated, data set be available from the originating patient data-base, and a more effective MSWord or PDF format interface for the production of the care-plan be developed.

Naturally, such saving would only occur in the preparation time prior to the first appointment, as subsequent appointments would draw upon the existing care-plan data. (It should also be noted that as Goulburn Valley Health use a different IT system to St. Vincent’s, no such saving was applicable to their patients during the trial, reinforcing the cost-efficiency concerns expressed below).

Capital cost

The above approach does not address the issue of the capital cost of the software concerned, and the issue that such cost would need to be repeated for each

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idiosyncratic hospital record system, if this approach were to be adopted by other hospital to improve patient care.

The provision of operational care-plans for the St.Vincent's system per above has been estimated at a capital cost of approximately \$20,000, with additional costs for the tailoring of specific additional tumour streams as they might be brought online.

We consider that to repeat this cost in all relevant hospitals to achieve the desired objectives would be both poor economics and poor ICT professional practice.

A better technical approach

It is worthwhile to consider, therefore, rather than what can be achieved by building on existing legacy systems in hospitals, what the optimum system to support truly portable care-plans might look like, and be most cost-effectively supported.

In this context a minor adaptation of already available and proven cloud-based clinical record systems would appear to offer a much better technical approach than piece-meal, hospital by hospital, tailored solutions requiring separate ongoing maintenance.

Consideration could be given to an interface with the national "My Health Record" system, which, seems to offer such a facility, however there are both serious concerns within the ICT profession as to its technical efficacy and design, and a low level of take-up by both patients/consumers and medical practices.³

It is reported that, as at March 2016, there were only 78,000 consumers and few practitioners using the "My Health Record" system.⁴

However since the adoption by the Government of an "opt-out" system, under which patients are enrolled unless they specifically refuse to do so, significant numbers of people have been enrolled (4.2 million by Nov 2016)⁵. No data has been released, to our knowledge, on whether practitioner take-up has increased accordingly.

The largest provider of independent cloud-based practice systems in Australia (Healthkit),⁶ launched in 2012 already operates in over 16,000 practices in Australia, (150,000 worldwide), operates in 40 countries, is headquartered in Melbourne, and includes the capacity for access by patients and to the patients clinical record via a simple interface from any PC with network capability by other approved health practitioners, such as the patients GP. This system is already available, free, to individual patients.

We consider that adding the care-plan information to such a record would appear to offer a simpler ICT solution, with less upfront and ongoing cost, and one that would

3 Final Review of PEHCR –Dec 2113, released May 2014 – Australian Department of Health

4 News Corp March 2015

5 Financial Review Nov 6th, quoting secretary of the Department of Health, Martin Bowles,

6 HealthKit is a global platform for patients and practitioners around the world, providing revolutionary clinical software tailored to the needs of practitioners of any profession in any country, along with services for patients tools to track your health.

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also be immediately available to any other hospitals trialling similar patient support shared-care approaches.

We make no judgement in this report on whether this would best be done in Victoria by using what some have described as a “cumbersome” Australian Government provided facility, judged by some ICT experts as out-of-date, now being mandated to encourage usage.

The alternative might be to consider using a private, award winning locally developed system, which has seen enthusiastic adoption by health practitioners world-wide.

As neither approach was able to be trialled properly during this project, it has, of course, been excluded from our calculations of potential benefit, other than as our estimation.

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Cost equations

Time and cost estimates					
	Minutes				
Time	Initial visit admin/overhead	Subsequent visit admin/overhead	Consultation	Total for first consultation	Total for subsequent consultations
2535 Surgeons	15	15	15		
2531 Generalist Medical Practitioners	15	15	20		
Nurse led Clinic (manual careplan)					
2543 Nurse Managers	60	15	40		
2544 Registered Nurses	60	15	40		
Nurse-led Clinic, (automatic care-plan)					
2543 Nurse Managers	30	15	40		
2544 Registered Nurses	30	15	40		
Cost					
2535 Surgeons	\$102.15	\$102.15	\$102.15	\$204.29	\$204.29
2531 Generalist Medical Practitioners	\$35.61	\$35.61	\$47.49	\$83.10	\$83.10
Nurse led Clinic (manual careplan)					
2543 Nurse Managers	\$77.80	\$19.45	\$51.86	\$129.66	\$71.31
2544 Registered Nurses	\$52.11	\$13.03	\$34.74	\$86.84	\$47.76
Nurse-led Clinic, (automatic care-plan)					
2543 Nurse Managers	\$38.90	\$19.45	\$51.86	\$90.76	\$71.31
2544 Registered Nurses	\$26.05	\$13.03	\$34.74	\$60.79	\$47.76

The above table takes the median hourly costs by occupation from the ATO and consultation/admin overhead timings provided by health practitioners to this study, to calculate the median operational cost of initial and subsequent consultations by occupation of the service provider.

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Structure of the service

The number of appointments for each patient, assuming survival, is structured as below, where “Standard” means the service is provided solely by the specialist, “Current” applies to the methodology currently used by the health providers in this trial, and “Alternative” means the theoretical “best-practice” approach advocated by the project steering committee.

Number of Appointments													
	Year												
	1	2	3	4	5	6	7	8	9	10	Total	Contact hours	
Standard													
Specialist	4	4	2	2	1	1	1	1	1	1	18	4.50	
NLC													
GP													
												4.50	
Current													
Specialist	4	4									8	2.00	
NLC		1									1	0.67	
GP			2	2	1	1	1	1	1	1	10	3.33	
												6.00	
Alternative													
Specialist	1										1	0.25	
NLC	3	4									7	4.67	
GP			2	2	1	1	1	1	1	1	10	3.33	
												8.25	

For economic purposes, the “Alternative” approach costing has also been calculated to reflect the initial use of computer generated care-plans, or the use of manual care-plans.

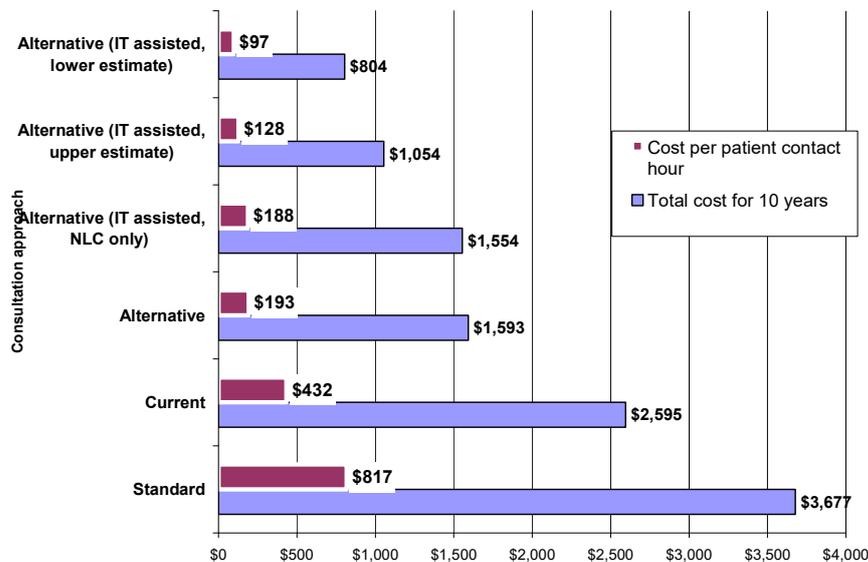
As no data was available, the value of the computer assisted ICT careplan in reducing overhead for specialists and GP’s, and for NLC after the first appointment, has not been included in the table following. It is estimated, however that a further ten year saving of \$500-750 could be anticipated, mainly from reducing the time for admin overhead for the personnel concerned.

We have reflected this estimate in the chart.

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Detailed Cost of Appointments												
	Year											
	1	2	3	4	5	6	7	8	9	10	Total	Cost per Patient hour
Standard												
Specialist	\$817	\$817	\$409	\$409	\$204	\$204	\$204	\$204	\$204	\$204	\$3,677	\$817
NLC												
GP												
											\$3,677	\$817
Current												
Specialist	\$817	\$817									\$1,634	\$817
NLC		\$130									\$130	\$194
GP			\$166	\$166	\$83	\$83	\$83	\$83	\$83	\$83	\$831	\$249
											\$2,595	\$432
Alternative												
Specialist	\$204										\$204	\$817
NLC	\$272	\$285									\$558	\$119
GP			\$166	\$166	\$83	\$83	\$83	\$83	\$83	\$83	\$831	\$249
											\$1,593	\$193
Alternative (with IT assisted careplan)												
Specialist	\$204										\$204	\$817
NLC	\$233	\$285									\$519	\$111
GP			\$166	\$166	\$83	\$83	\$83	\$83	\$83	\$83	\$831	\$249
											\$1,554	\$188

Economic evaluation
Shared care Nurse-led clinic approach for Low risk urological patient post-operative



Conclusions

Economic value to the Health System

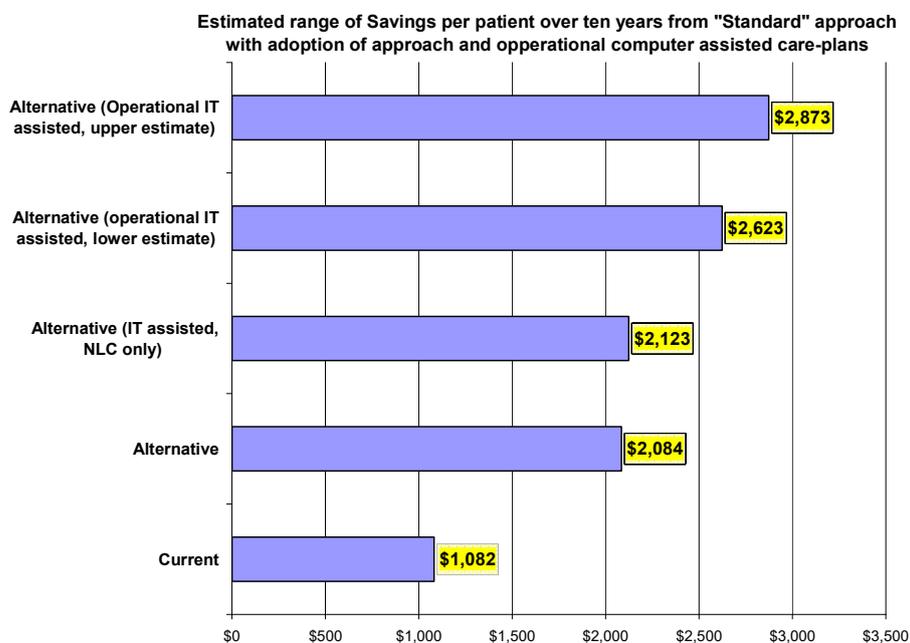
Clinical outcomes resulting from the adoption of the “shared-care” approach and Nurse-led clinics are outside the scope of this report, however it appears that the economic benefits of this approach are clear, and that the wider adoption of this approach incurs a number of ongoing fiscal savings.

The most significant cost-factors are

- a) the adoption of Nurse-led clinics as the primary approach to post-operative care (Alternative option)
- b) The availability of fully operational, portable, digital care-plans and supporting patient clinical records. (Alternative with IT assisted care-plans)

Overall total estimated cost savings over ten years from the “Standard” approach range from approximately \$2000-\$2700 per patient, and from the “Current approach” range from \$1000 to \$1700 per patient, dependant on the factors above.

In addition to these reduced costs of health provision, the approaches trialled allow for more time to be spent with patients, and arguably, a better use of the time of specialists by reducing their involvement in work that could be undertaken by Nurses and GP’s.



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Economic Value to the Patient

For the patient, whilst the cost differentials above do not directly convey benefit, the additional consulting time contact hours provided to them, may allow more in-depth discussion, and thus more effective information on their post-operative needs.

In addition it is likely that patient waiting times for consultations may be reduced, as NLC appointments are specific to them, and the involvement of their local GP may also reduce travel time for them to attend consultations.

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About the Pearcey Institute

Under its former name, CIER, the Pearcey Institute was formed in 2004-5, with support from the Government of Victoria, to create a repository and think-tank for competently researched, up-to-date, and analysed data on employment, markets, revenue streams, R&D, processes and management methods, specifically focused on high technology, innovative, and emerging industries ICT and biotechnology.

The organization has conducted detailed analysis and reporting on Information Technology, and Reports on other high technology industries, for Government and industry bodies for over ten years.

The Pearcey Institute operates as a not-for-profit body, and is accordingly registered with the ATO and ACNC as a bona-fide tax-free research body. Its funds are allocated to continued research into the improvement of trend, forecasting, and indicative analysis for innovative industries and the digital economy.

From July 1st 2016, in recognition of the pioneering contribution to innovation made by the late Professor Trevor Pearcey, the formal name of the Association was changed to Pearcey Centre for Innovative Industry Economic Research Inc. also known as the Pearcey Institute.

About the lead researcher



Ian Dennis has served the IT industry for nearly forty years, in his roles as a software developer, software company and consulting company director, and through his various honorary positions. These include Chairman, Australian Computer Society – Victoria, National Director, Economic and Industry Policy, Australian Computer Society, and National Chairman, Pearcey Foundation Inc.

- He was awarded an Australian Design Award for software in 1987 and was made a Life Member of the Software and Services Industry Federation in 1989 for his services to industry.
- He served continuously on Federal or State boards of Information Technology trade bodies from 1981 to 1996, including serving as President of both the Australian Software Houses Associations and the Software and Services Industry Federation, and Director of the AIIA
- In 1993 he was awarded the Institute of Chartered Accountants in Australia - Microsoft Excel Award.
- In 1997 he was elected an honorary Fellow of the Australian Computer Society for significant contributions to the Australian information technology industry.
- In 1998 he founded, and is now Emeritus Chair of, the Pearcey Foundation.
- Ian is a United Nations approved International Trade consultant (UNCTAD/GATT) International Trade Centre, and a member of the Roster of Experts in Technical Consultancy Services, and
- A Registered Expert in Information Technology, Research Directorate DGXII, European Commission.
- And an accredited Gateway Team Leader for major Government ICT reviews
- He is Chairman and Executive Director of the Pearcey Centre for Innovative Industry Economic Research, (Pearcey Institute).
- He was the lead researcher and editor of the ACS ICT Statistical Compendium from 2008 to 2013 and is acknowledged as an expert on ICT economic statistics.

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