THE VIRTUAL WARD

MANAGING THE CARE OF PATIENTS WITH CHRONIC (LONG-TERM) CONDITIONS IN THE COMMUNITY

An Economic Assessment of the South Eastern Trust Virtual Ward

Introduction and Context

Chronic (long-term) conditions are increasingly becoming a primary concern and are responsible for at least 60% of the global disease burden[1]. Research has shown that a large number of people who have long-term conditions (an estimated 17.5 million in the UK; and approximately 500,000 in Northern Ireland), are frequently hospitalised as an emergency[2]. The Department of Health[3] states that people with chronic conditions are significantly more likely to see their General Practitioner (GP) accounting for up to 80% of GP consultation. It also reports that:

- 60% of hospital bed days are for patients with chronic diseases or related complications
- Two thirds of patients admitted as medical emergencies have exacerbation of chronic disease
- Some people are highly intensive users of services with 10% of in-patients accounting for 55% of in-patient days.

Virtual Ward Service Development

Historically, patients with chronic conditions, primarily respiratory, diabetes and heart failure in the South Eastern Trust tended to have very frequent, sometimes prolonged admissions to hospital, particularly over the winter months To change the way these patients were managed a virtual ward service was established. The aim was to improve the care offered to this group of patients by:

- Case managing those most at risk of hospital admission
- Providing a timely assessment and intensive support to patients experiencing an acute exacerbation of their condition and co-ordinating a range of services to reduce admission to hospital
- Facilitating earlier discharge of patients with long term condition thereby reducing length of stay
- Identifying a single point of contact for care and advice for patients, carers and other health professionals

[1] WHO 2004
[2] Hutt et al 2004
[3] Department of Health 2005

- Providing an integrated Health and Social Care service for people with long-term chronic conditions to have a positive impact on the quality of life for clients and their carers
- More efficient use of existing skills within the workforce

The Virtual Ward started as a small innovative Pilot Project that ran from the 1st January to 31st March 2009 with one highly-skilled Nurse Practitioner taking on the role of the Virtual Ward Co-ordinator.

Due to the success of this Pilot, the Pilot was continued and a Business Case was submitted to the Local Commissioning Group. Funding was provided to roll out the Model to three Localities within the South Eastern Trust in January 2010 and a further two Band 7 Nurses were recruited to the project.

The Virtual Ward operated in the Localities of North Down, Ards and Lisburn. Potential patients were required to be over 18 years and diagnosed with one or more chronic disease – respiratory, heart failure and diabetes and had one or more hospital admission in the previous year. Patients were initially identified using a computer algorithm (Kings Fund, 2005[4]) but this proved to be time-consuming and inefficient with issues around coding. Therefore patients were identified by GPs and referrals from members of the multi-professional integrated team including Allied Health Professionals, District Nurses and Social Care staff. Patients were also identified through the review of the GP Chronic Disease Register

These potential patients were enrolled onto the Virtual Ward and a Case Co-ordinator conducted an initial screening visit to assess their suitability for virtual ward care. After a full explanation of the Virtual Ward suitable patients were asked for their verbal consent to be cared for out of hospital by the virtual ward team. A holistic baseline assessment was then undertaken and a personalised care plan developed in partnership with the patient. If the patient became acutely unwell, they contacted the Virtual Ward and the Virtual Ward Co-ordinator provided a timely response and full health assessment of their condition and contacted their GP.

If considered safe and appropriate, the patient was nursed at home and intensive support provided through nursing and social care support. Similar to a hospital ward manager, the Case Co-ordinator was responsible for co-ordinating the case and clearly communicating with all involved, to ensure a seamless integrated service and avoid potential duplication of services.

A system was put in place to 'flag' the patients on the Virtual Ward so they are easily identifiable as a Virtual Ward patient. This was vital to ensure that if a patient presented at A&E or required medical input from GP 'Out of Hours' services, the

[4] King's Fund (2005) Predictive analysis

attending doctors would be aware of the patient's status and could access information regarding their ongoing care and treatment plan.

The clinical input to patients on the Virtual Ward depended on their clinical condition and acuity. Patients who are acutely ill required 1+ visits daily. Patients were 'discharged' from the virtual ward to their usual Key Worker when they required low intensity input and their condition stabilised. Expert patient programmes were encouraged.

This report provides an economic assessment of the virtual ward. Data available has only allowed the assignment of monetary values to a small number of benefits. However, the following narrative shows that there is the opportunity for further monetisation of other benefits moving forward with the improvement of data capture in the future. This data will include the reduction in A&E attendances and the impact on GP consultation. The analysis is based on a 3 years of activity (March 2010 -March 2013). This time period was chosen because the Virtual Ward was not considered to be operating at full capacity until March 2010 and a review of activity over three years allowed for a more complete assessment of the service/s. Within this period, there were 447 episodes of care with 6,053 contacts recorded by the Virtual Ward Co-ordinator. Twenty six patients were admitted to the Virtual Ward on more than one occasion. There were 421 unique service users on the Virtual Ward with 812 hospital admissions avoided.

Key Benefits of this innovation

Benefits for those using the service:

The Virtual Ward gave patients choice and an alternative to in-patient care and provided high quality care to patients with long term chronic diseases at home. As a consequence, hospital admissions were avoided. The decision that a hospital admission had been avoided was made jointly by the patient's GP and the virtual ward coordinator. Over the three years 812 hospital admissions were avoided and 447 episodes of care were provided by the virtual ward service. The benefits of reduced hospital admission for the Trust will be expanded on in a later section under Benefits for the South Eastern Health and Social Care Trust and healthcare system.

The reduction in hospital admissions had a direct impact on the patient by improving patient's quality of life (see case study A for example).

Case Study A – Mr W

Mr W is a 71yr old man with a history of COPD. He was first admitted to the Virtual ward service in June 2011.

He had 3 admissions for infective exacerbation of COPD in the preceding year and reported almost constant use of antibiotics and steroids to control his symptoms. Mr W and his wife reported a very poor quality of life, with low exercise tolerance due mainly to shortness of breath but also due to knee pain – he required a knee replacement but was considered unfit for surgery due to his chronic respiratory condition.

The Virtual Ward co-ordinator fully assessed Mr W optimising medication and providing education to develop him as an expert patient.

Since June 2011 Mr W has not been admitted to hospital for his chronic condition and his relatively frequent exacerbations (approximately 6 per year) are assessed, diagnosed and treated in a timely manner with the patient and his wife encouraged to be major stakeholders in the development and agreement of all treatment plans.

With good medicines management and early efficient treatment of exacerbations, Mr W's respiratory condition was considered well enough controlled that he was able to have a knee replacement in 2013 and also a major abdominal hernia repair under general anaesthetic in 2014.

Mr W and his wife both report a significant improvement in quality of life and are both more confident in dealing with the exacerbations which are part of his chronic lung condition.

The impact of reduced hospital admission has also reduced the risk of potential hospital acquired infections and other associated risks. Healthcare associated infections pose a serious risk to patients, staff and visitors. They can incur significant costs for the NHS and cause significant morbidity to those infected.[5] The cost of treating a healthcare associated infection varies, but the Department's productivity calculator estimates that each avoidable healthcare associated infection costs the NHS £4300[6].

A patient satisfaction survey with a high 70% return rate indicated 100% very satisfied with the quality of care and 85% felt more confident in managing their own condition Patients were encouraged through patient education to increase their understanding of their condition, medication and treatment plan resulting in improved compliance. Medication compliance was noted by more appropriate ordering for medication through the GP Practice but not formally audited. With this improved understanding of their condition, patients were encouraged to contact the Virtual Ward in a timely

[5] NICE (2011) 'Guidelines for the prevention and control of HCAI in Secondary Care' Nov 2011 (ph 36)
[6] NAO (2009) Reducing Healthcare Associated Infections in Hospitals in England (p 28)

manner when they begin to feel unwell. All Virtual Ward Co-ordinators had advanced training in health assessment and were independent prescribers so could diagnose and treat quickly, often averting A&E attendances as well as hospital admissions. Within the initial Pilot, the A&E attendances of patients were monitored and compared to their A&E attendances in the previous year. There was a 60% reduction in A&E attendances for this group of patients (see Case Study B).

Case Study B: Mrs X

Mrs X was an 82 year old lady who lived alone in a one bedroom bungalow. She had a care package consisting of 2 carers 4 times per day with her daughter providing additional care.

She was chair bound and required hoisting to/from bed and toilet. Mrs X had a history of severe COPD requiring 24 hour oxygen therapy and was known to care management, district nursing services and the respiratory team. She was admitted to the virtual ward service and remained in frequent contact until her death 20 months later.

In the year before introduction of the virtual ward service Mrs X had 24 attendances at A/E resulting in 20 separate admissions to hospital for exacerbation of her respiratory disease – she spent most of the year in hospital. In the year following her admission to the virtual ward Mrs X had only one attendance at A/E which did result in admission to hospital but this was for acute pancreatitis and not her long term condition.

Mrs X, her daughter and her GP all positively evaluated the virtual ward service and all felt that without the service input her pattern of frequent admissions would have continued.

Benefits to the South Eastern Health & Social Care Trust and Healthcare system

The Virtual Ward demonstrated considerable economic benefits. A&E attendance was reduced (but not quantified) and hospital admissions avoided and earlier hospital discharge facilitated, thereby improving patient flow through the hospitals. Prior to 2010, many of these patients had experienced frequent hospital admissions and although support was given through specialist teams, many of these were hospital based and could not provide a quick response if the patient became unwell. The reduction in admissions has been calculated on the average bed day for patients at that time. The cost per hospital bed is £350 based on KPMG cost analysis on 2014/15 costs. This has been adjusted by 2.5% pa to reflect cost in previous years. This was a Regional Cost within Northern Ireland. See Appendix A.

This equated to the saving of 4547 hospital bed days. This figure was based on the average length of stay in a South Eastern Health and Social Care hospital for a patient

with a chronic disease in a medical ward at that time. In 2010 / 11 this was nine days, but 2011 / 2012 and 2012 / 2013 it was approximately 5.5 days. The Virtual Ward based assumptions on a figure of 9 days for 2010 / 11 and of 5 days from 2011 - 2013. The costs avoided were calculated over the 3 year period at £8,804,529. (see Appendix A).

The running costs over three years are approximated at £566,273. This equates to a total saving of £8,238,256.

GPs as the main stakeholder with the Virtual Ward were also very satisfied with the Virtual Ward service. Some of the GP feedback has been as follows:

- Dr N GP Pleased with the service – *I have noticed a marked reduction in telephone calls from the patients on the virtual ward.*
- Dr B GP - *Excellent service, it's great that the co-ordinator can fully assess the patient and prescribe appropriate medication without the GP having to visit. I have been kept fully informed of the care prescribed.*
- Dr S GP - *The virtual ward doesn't just look at the chronic condition; The co-ordinator spotted a suspicious lesion on one of my Patients and correctly identified it as? Malignant – the patient received timely intervention*.

Benefits for staff:

Staff involved in the Virtual Ward gained expert knowledge and clinical skills in supporting patients with complex chronic disease. They reported a higher level of satisfaction being at the forefront and developing this innovative service.

The Virtual Ward Co-ordinators have presented the service model and to the following:

- 2009 Health Service Journal Award finalist
- 2010 NI RCN Nurse of the Year finalist
- 2011 Nursing Standard Award
- Presented to Long Term Conditions Workshop and Conference
- NI e-Health Conference 2013

Key Costs of the Virtual Ward

The total set up cost for the Virtual Ward was £32,974 (see Appendix B).

Direct Set-up Costs

Two of the Virtual Ward Co-ordinators attended a Case Management training course at the University of Ulster. The third Virtual Ward Co-ordinator was a qualified Nurse

Practitioner and an Independent Nurse Prescriber and therefore did not require this additional training. To allow the two staff to attend for the Case Management course, they were required to be back-filled in their District Nursing role by Band 5 Bank staff 3 days per week for 36 weeks.

The Virtual Ward Co-ordinators developed a Virtual Ward leaflet. The time they spent developing the leaflet and the printing costs are identified. A Virtual Ward Steering group was set up to develop the service. This involved 5 meetings including the Commissioner, hospital Consultant, GP and a Service User. The participants either attended in working time or gave of their time freely. The Service User only attended one session.. Managers were involved in developing an operational policy and in the implementation of the service. The Steering group costs equated to approximately 1 hour per week over 12 weeks. A smaller working group developed an Operational plan, communication strategy and performance management and ensured implementation. This equated to approximately 3 hours per week over 24 weeks.

Indirect Set-up Costs

Office space and desks were provided by the Trust. Staff were recruited to the project through routine HR processes and all were internal appointments. No additional costs were identified.

Running Costs

The recurring annual operating costs for the Virtual Ward over the 3 year period was £566,273, see Appendix C. This includes the employment of the three Virtual Ward Co-ordinators. The Co-ordinators all have Trust mobile phones to communicate. A number of services input into the Virtual Ward co-ordinated by the Virtual Ward Co-ordinator as required, depending on the needs of the patient on the Virtual Ward. This includes input from the District Nurses. In many cases the District Nursing service would already be inputting, but the additional input was calculated at 18 additional contacts per week. Input from Allied Health Professionals, especially Physiotherapy was based on 6 hours per month and a cost of £5,278 per year.

Unfortunately it has not been possible to cost the Social Care input. This information has not been captured by the Virtual Ward. There are occasions where to maintain a patient at home, a Social Care Domiciliary Care package requires to be commenced or increased. As this does not occur in all occasions, it is extremely difficult to cost.

There are on-going management costs to the service to include supervision of staff, appraisals, service meetings and development and performance returns. This has been taken as 6% of the total running costs.

Indirect running costs included non-medical prescribing and the use of telehealth monitoring. The Virtual Ward Co-ordinators are independent prescribers. The prescribing costs are part of the primary care global prescribing budget.

Within the South Eastern Trust there is a Regional contract set up for a telehealth assistive technology system. This enables patients with a chronic disease to be safely monitored at home with alerts being sent to Key Workers when individualised parameters are exceeded. This system is suitable for selected patients. The Virtual Ward Co-ordinators, specialist nurses and medical practitioners have access to refer appropriate patients for telehealth monitoring. The Trust is set Regional targets to meet in respect of usage.

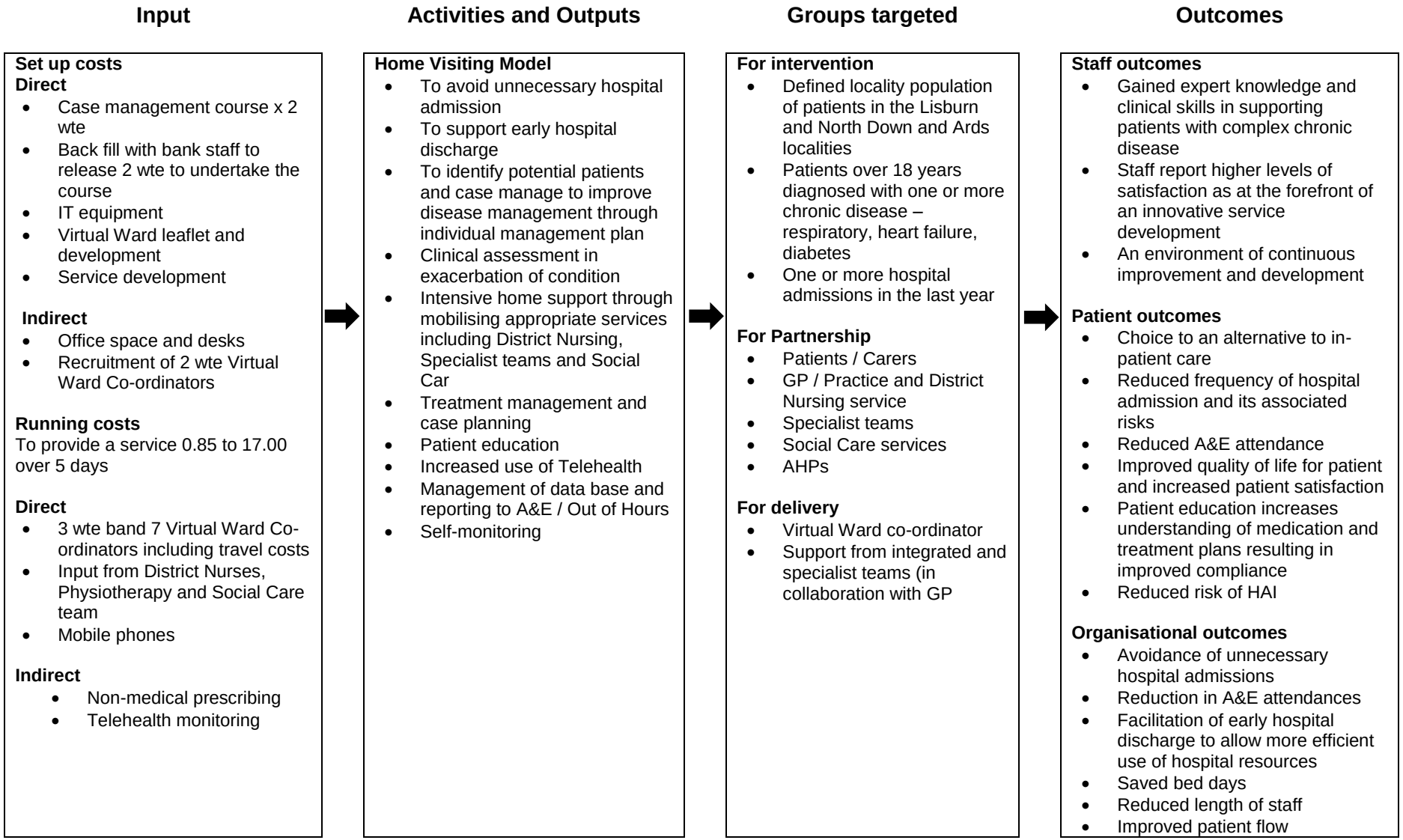
Background to the Economic Assessment

During 2013 the author of this Report, Janice Colligan RGN RM RHV BSc (Hons), Operations Manager, Older People's Service, had the unique opportunity of a joint Programme by the Royal College of Nursing and the Office for Public Management, on equipping nurses to understand and evidence economic assessment for leading service innovation. This was funded by the Burdett Trust for Nursing and supported by the Directors of Nursing.

This Programme gave us the opportunity to demonstrate the economic benefits and value for money of our service developments through populating pathways to outcome framework and directing a more robust analysis of our service development.

This has proved invaluable in further developing our Model of Care to provide a service over 24 / 7 which will meet our future service needs. The South Eastern Trust has built in the experience of the Virtual Ward concept and has been successful in their business case for an Enhanced Care at Home Model, working in partnership with GPs through Integrated Care Partnerships to provide a full range of acute care at home. The learning and experience gained in undertaking this economic assessment has proved invaluable in identifying areas for improvement in developing reliable data collection and reporting systems to track and provide feedback on performance of key processes and outcomes. The Trust is now working with the Institute for Healthcare Improvement using a Triple Aim approach to prototype the Enhanced Care at Home Model to test and learn through a robust framework before planned scale up and spread across the Trust and further within the HealthCare system.

South Eastern Trust Virtual Ward: Pathways to Outcome Model



References

1. WHO (2004) cited in Department of Health 'Chronic Disease Management: A Compendium of Information
2. Hutt et al (2004) cited in Case Management a Position Paper DHSSPS
3. Department of Health (2005) Apply systematic approach to care for people with long-term conditions
4. King's Fund (2005) Predictive analysis: Patients at risk of rehospitalisation, the combined model
5. NICE (2011) 'Guidelines for the prevention and control of HCAI in Secondary Care' Nov 2011 (p. 36)
6. NAO (2009) Reducing Healthcare Associated Infections in Hospitals in England (p. 28)

*This case study was completed by **Janice Colligan,** Locality Manager, South Eastern Health and Social Care Trust (SEHSCT) in **December 2015**.*

Janice successfully completed a collaborative learning programme designed to empower nurses to understand, generate and use economic evidence to continuously transform care. The programme was delivered by the Royal College of Nursing and the Office for Public Management, funded by the Burdett Trust for Nursing and endorsed by the Institute of Leadership and Management.

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Appendix A – Hospital Admissions Analysis

Identify	**Quantify**	**Monetise**		
Hospital admission avoidance through preventing admission		2010/11	2011/12	2012/13
	Admissions avoided	1,092	1,641	1,814
	Average Length of Stay	9	5	5
	Bed days avoided	9,828	8,205	9,070
	Cost per day based on KPMG £350 (2014 / 15) This has been adjusted by 2.5% pa to reflect on previous years	£317	£325	£333
	Hospital Costs avoided	**£3,116,289**	**£2,666,705**	**£3,021,535**

Appendix B – Set up costs for Virtual Ward

	Set Up Costs		
	Identify	Quantify	Monetise – All costs are taken as full costs as of 2014 and are compliant with Treasury guidance.
Direct	Case Management course x 2 staff by University of Ulster	2 staff (3 modules over 36 weeks, one academic year)	£9,060
	Nurse back fill to all 2 Virtual Ward Co-ordinators to be released to undertake the course	Band 5 Bank nurse, cost of 3 days / week over 36 weeks	£13,785
	IT equipment Virtual Ward leaflet Virtual Ward development cost of leaflet	2 lap tops 1000 copies 3 x Band 7 Virtual Ward Co-ordinators x 2 hours (included in Running costs = £146)	£1,812 £362
	Service development and implementation costs	Service development costs 8C, 8B, 8A, Band 7 for 1 hour per week for 12 weeks 24 weeks operational set up costs 8B, 8A, band 7 for 3 hours / week	£1,566 £6,390
Indirect	Office space and desks	Space available in Trust Integrated Team offices	No additional cost – in kind
	Recruitment of x 2 wte Virtual Ward Co-ordinators	Recruited from within the Trust	No additional cost – in kind

Appendix B – Set up costs for Virtual Ward

	Set Up Costs		
	Identify	Quantify	Monetise
	Virtual Ward Steering group (5 meetings in developing the service)	Input from a User, Commissioner, A&E, Hospital Consultant & GP, Primary Care Managers	No additional cost – in kind

Costs where appropriate have been discounted at 2.5% per annum from 2014 prices

Appendix C – Running Costs for Virtual Ward

	Running Costs				
	Identify	Quantify	Monetise		
			2010/11	2011/12	2012/13
Direct	Band 7 Virtual Ward Co-ordinator	3 wte	£142,806	£142,947	£143,079
	District Nursing additional input	18 additional contacts per week. 936 per year and based on average District Nursing contacts per day.	£33,242	£33,275	£33,287
	On-going management costs and overheads	6% of total running costs	£1,758	£1,759	£1,761
	Physiotherapy additional input	Band 7 6 hours per month	£10,668	£10,679	£10,688
	Mobile phones and running costs under phone contract	For 3 wte £3 per month	£108	£108	£108
Indirect	Non-medical prescribing	All 3 Virtual Ward Co-ordinators are Independent Prescribers	Included in the Primary Care prescribing budget		
		Annual Running Costs	£188,582	£188,768	£188,923
		Total Running Cost	£566,273		