“Virtual wards, telehealth POPPs etc.: how do we know what works?”

Martin Bardsley
Director of Research
Nuffield Trust

Making health services fit for an ageing population: how to develop life enhancing services for older people.

Kings Fund

22 October 2013
Nuffield work includes studies of....

Telehealth and Telecare – Whole System Demonstrator in 3 areas

National Integrated Care Pilots

**Partnerships for Older People**

Birmingham Own Health

**Virtual Wards in 4 sites**

**Marie Curie Nursing Service**

NW London Integrated Care Pilot

British Red Cross ..Care in the Home

*Not clear what works see Purdy et al (2012) Interventions to Reduce Unplanned Hospital Admission: A series of systematic reviews. Bristol University Final Report*
Ten-year trend in emergency admissions (46 million admits)
By ambulatory care sensitive conditions...
Rationale for the virtual ward

Need to respond to growing needs of people with chronic health problems

Emergency admissions have been rising for some time – undesirable for patients and costly in terms of acute hospital care. No one explanation for rise in emergency admissions – part patients factors, part health systems

Aim to develop approaches that are preventive before crises emerge.
   Needed to identify patients at risk of future admissions

Needed a linked process for managing high risk patients in community settings
Analysis of virtual wards: a multidisciplinary form of case management that integrates social and health care

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2University of Auckland
3New York University
Virtual Wards = Predictive Model + Hospital-at-Home
Virtual Ward A
Community Matron
Nursing complement
Health Visitor
Ward Clerk
Pharmacist
Social Worker
Physiotherapist
Occupational Therapist
Mental Health Link
Voluntary Sector Link

Specialist Staff
- Specialist nurses
- Asthma
- Continence
- Heart Failure

Virtual Ward B
Community Matron
Nursing complement
Health Visitor
Ward Clerk
Pharmacist
Social Worker
Physiotherapist
Occupational Therapist
Mental Health Link
Voluntary Sector Link

GP Practice 1
GP Practice 2
GP Practice 3
GP Practice 4
GP Practice 5
GP Practice 6
GP Practice 7
GP Practice 8
Lewis* described the following model of care known as 'virtual wards' (1 of 2)

- Each virtual ward is linked to a specific group of GP practices so pop c.30,000
- A patient is offered "admission" to a virtual ward if a risk prediction tool identifies him or her as being at high risk of a future emergency hospital admission.
- Each virtual ward has a capacity for 100 patients, i.e. 100 “virtual beds” per virtual ward. These are subdivided into five "daily" beds, 35 "weekly" beds and 60 "monthly" beds, reflecting the frequency with which different patients are reviewed on a ward round.
- Virtual ward staff discuss patients on office-based "ward rounds", participating either in person or by telephone.

Lewis* described the following model of care known as 'virtual wards' (2 of 2)

- Certain specialist staff (e.g. tissue viability nurse) may cover several virtual wards
- The virtual ward staff share a common medical record.
- Systems to alert local hospitals, emergency departments and out-of-hours providers that a patient is on a virtual ward
- When a patient has been assessed by all relevant virtual ward staff, and has been cared for uneventfully for several months in the ‘monthly review’ section of the ward, then the ward staff may feel that the patient is ready to be discharged back to the care of the GP practice.

## Adaptations and Evaluations

<table>
<thead>
<tr>
<th>Site</th>
<th>Feature</th>
<th>Evaluation</th>
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<tr>
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<td>New York</td>
<td>Homeless</td>
<td>RCT</td>
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<td>Toronto</td>
<td>Discharge Virtual Ward</td>
<td>RCT</td>
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<td>North Somerset</td>
<td>Clinical referrals</td>
<td>Local study</td>
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</table>

Plus increasing number of models in UK and abroad

See also Chenore T, Pereira Gray DJ, Forrer J, Wright C., Evans PH, Emergency hospital admissions for the elderly: insights from the Devon Predictive Model J Public Health (2013)
Evaluation Methods VW

Three pilots sites with different models of VW
Retrospective analysis of existing projects
Track cohort of specific patients to look at service use over time
Exploit existing data through secure data linkage
Compare change to matched control group (matched on multiple variable using propensity and prognostic score)
Costing service activity and interventions
Information flows

Local Operational Systems → HES/SUS → Encrypted subset Client-event based → Linked Data Subsets

Local Operational Systems → GP → Encrypted subset Client-event based → Client-bases

Local Operational Systems → Community Nursing Activity → Encrypted subset Client-event based → Needs variables (Risk Groups)

Local Operational Systems → Social care Client event data (Possibly via “Tracs”) → Encrypted subset Client-event based → GP & Community Use

Local Operational Systems → Linked Data Subsets → Hospital Use

Local Operational Systems → Linked Data Subsets → Social Care Use

NSTS Batch Tracing
Health and social care timeline – an individual’s history

- High intensity social care service
- Other social care service
- Social care assessment
- Inpatient - discharge
- Inpatient - admission
- A&E visit
- Outpatient visit
- GP visit
Prevalence of health diagnoses categories in intervention and control groups

- Hypertension
- Injury
- Falls
- Atrial fibrillation and flutter
- Ischemic heart disease
- Cancer
- Diabetes
- Mental health
- Congestive heart failure
- COPD
- Cerebrovascular disease
- Angina
- Anemia
- Renal failure

Control vs. Intervention
A bit on methods
Virtual Ward patients

The virtual ward patients in one site had

• a mean combined model score of 0.63 compared with score of 0.06 for the rest of the population

• a higher rate of emergency hospital admissions (2.64 per patient compared with 0.06)

• more general practice surgery visits (42.99 visits compared with 5.55)

• more contact with community nurses (68.6 per cent of virtual ward patients had been in contact with community nurses in the year before receiving the intervention compared with 1.0 per cent for the rest of the population)

• more chronic health problems 2.48 vs 0.07 conditions for the rest of the population

• more social care services eg 19.3 per cent of virtual ward patients had received home care at some point in the previous twelve months, compared with 0.5 per cent for the rest of the population.
Lengths of stay on the Virtual Wards
Changes in hospital activity

<table>
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<th>Estimate</th>
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<th>Upper CL</th>
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<tr>
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</table>
Impact on care use

Sample dominated by one site

Difficulties in matching to patients with complex health problems (had to use national hospital based models)

No evidence of reductions in emergency admissions at 6mnths

Indications of possible reductions in OP and elective care
Reality of implementation

In largest site the model ‘changed’

- from multidisciplinary case management to standard service delivered by a community matron supported by an administrative assistant
- Predictive model not used consistently throughout
- organisational commitment and investment in preventive care for high risk patients but local GPs seemed less visible
- Long lengths of stay linked with incentives to have 500 patients on VW

Large differences between sites in costs of VW itself

Two sites still in early stages- and have subsequently developed
General observations on VW

There were different 'forms' of virtual ward in this study and we suspect an even wider number of variants in other settings.

Our analyses have shown how patients being cared for on virtual wards included some people with serious complex illnesses that have important health service implications.

Virtual wards are part of a generic approach to long term care which may be justified in other terms, for example as ways to improve the quality of communication between community health staff, the continuity of care, patient experience or safety. No simple solutions we can take off the shelf

Though the evidence was not conclusive, the differential levels of service use in high risk patients suggested that these would provide more fertile ground for interventions aimed at reducing hospital use.
The Partnership for Older People Projects (POPPs)

• £60m investment by DH with aim to:
  
  “shift resources and culture away from institutional and hospital-based crisis care”

• 146 interventions piloted in 29 sites.

We looked at a subset including

Support workers for community matrons
Intermediate care service with generic workers
Integrated health and social care teams
Out-of-hours and daytime response service

+ 4 different short term assessment and signposting services

“We recommend expanding the Partnerships for Older People Projects (POPPs) approach to prevention across all local authorities and PCTs.”
Impact of eight different interventions on hospital use

- Support workers for community matrons (A)
- Intermediate care service (B)
- Integrated health and social care team (C)
- Rapid response services (D)
- Short-term signposting service (E)
- Short-term signposting service (F)
- Short-term signposting service (G)
- Short-term signposting service (H)

Legend:
- Intervention group
- Controls
- Intervention effect

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Impact of Marie Curie Nursing Service on place of death & hospital use at the end of life

- 29,538 people who received MCNS care from January 2009 to November 2011
- Matching techniques used to select 29,538 individually matched controls from those who died in England from January 2009 – November 2011
- Matched on demographic, clinical and prior hospital use variables
- People started receiving MCNS care on average 8 days before death

So …..
Selected observations……

1. Recognise that planning and implementing large scale service changes take time

2. Define the service intervention clearly – and be clear when the model is changed

3. Pay attention to the process of implementation as well as outcome. Look for intermediate and proxy outcomes for early change
More selected observations

4. If you want to demonstrate statistically significant change, size and time matter

5. Success or failure will depend on targeting the right people not just volumes

6. Hospital use and costs are not the only impact measures

7. Carefully consider the best models for evaluation – prospective/retrospective; formative/summative; quant./qualitative
Acknowledgements (Virtual Wards Study)

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Impact on self reported health

*BMJ* 2013;346:f653 doi: 10.1136/bmj.f653 (Published 26 February 2013)
Crude (unadjusted) trends in emergency hospital admissions

Admissions per person per quarter

Quarters before/after trial

Start of trial

- Control
- Intervention