A best-practice case management model for patients with multi-morbidity

Benefits realisation and other key issues

Briefing Notes

Dr David Cochrane, 2011

Conrane Consulting
(1) Introduction

This paper sets out the evidence for a best practice model for case management drawn from both recent research evidence and successful NHS programmes. The intervention is made available to patients with long-term conditions and multi-morbidity of 3 or diagnoses. This group constitute 5% of a nationally typical population (deprivation, age/sex profile etc) – 80% are over 65 and 20% under 65. However since they currently consume 50% or more of healthcare resources (both secondary and primary care) they offer maximum opportunity to reduce cost by improving quality. This outcomes reported in this paper are based on 10 years practice in the UK and action research in the United States by research geriatricians at Johns Hopkins University which is now being mainstreamed under the Affordable Care Act. It is a primary-care-linked, practitioner-led service offering a pro-active, multi-disciplinary, holistic and patient-centred case management service initially on a face-to-face basis - including visits to the patients’ own homes - but often reverting to telephonic contact. The briefing paper covers the following:

- Evidence of effective case
- Potential benefits from a comprehensive programme
- Key lessons for best practice experience
- The role of risk stratification and predictive modelling
- Going forward

(2) Evidence of effective case management

Case and disease management programmes expanded rapidly in the US during the 1990s and in the NHS over the last 10 years. One key challenge was that this rate of growth tended to lag behind emergence of firm evidence to identify which models constitute effective practice. In the last 5 years, however, we have begun to gather two sources of better evidence:

- Replication of a best-practice model (originally piloted at Castlefields) delivering similar outcomes with different practitioners, in different localities in the NHS
- Randomised control trials from the United States.

The first Castlefields Pilot One of the earliest, best-practice models was the primary-care linked, holistic case management model delivered in the community in collaboration with the patient’s GP. The approach is pro-active and preventative with a central focus on developing the patient as a key agent in the design and delivery of the programme. It recognises that the needs of high-risk, high-

---

1 “Future directions include the need to isolate the interventions ...that are most effective in producing the results...if a cost saving is to be a key, here needs to be standard guidelines for measurement and reporting” See Aliotta, S, Case management of “at risk” older people, in Ed. Cochrane, D. Managed Care and Modernisation, OUP 2001 Also “So far, attempts to improve the care of (patients) with chronic conditions have produced disappointing results. ...Significant obstacles to success have included lack of adherence to evidence-based “best practices” and poor coordination with primary care in planning and sharing information” J.Pascala quoted in Guided Care/2010 BMJ Group Award – Getting Research into Practice

needs patients go beyond the purely clinical. Another key factor is that this group in the population have multiple long-term conditions and that co-morbidity itself brings particular challenges in clinical management for healthcare professionals due to the impact on the psychological, social and physical functioning of patients. Originally developed in HMOs in California, the model was first piloted in the UK in 2000 in Castlefields Health Centre where Prof David Colin Thome was then senior partner. This collaborative project was led by Conrane Consulting and Care Continuum, a managed care development group from the United States. The pilot proved a great success in terms of improved clinical outcomes and functioning for patients. In the first year of the project, the nurse case manager, Jane Molyneux RN managed 100 patients who had between them amassed 120 admissions in the year before the programme. This same group produced just one admission in the subsequent 12 months - a rate reduction substantially higher than could be expected due to “regression to the mean”\(^3\). Moreover the practice measured a reduction in unscheduled admissions amongst all people over 65 versus a local control practice\(^4\) to below 180 per 1000 despite the high deprivation factors in the served population\(^5\).

**Replicating the Castlefields Results** The success of the Castlefields model led in part at least to the national community matron programme, introduced by the DH in 2005 when Dr Colin-Thome had become National Clinical Director for Primary Care with a special responsibility for long-term conditions\(^6\). In the wake of the community matron programme, Conrane subsequently rolled out an enhancement of the Castlefields model in Surrey, Sussex and North West London in collaboration with Care Continuum and Imperial College\(^7\). The graphs below show outcomes for patients managed my Sue Barrett RN with one of her GP practices in West Sussex over a 12 month period. Again patient satisfaction and functioning have improved dramatically, alongside an over 80% reduction in both admissions and (critically in terms of GP engagement) attendances to the GP by this cohort of patients. Again this data has been replicated by other practitioners in the programme.

**How are savings derived?** For secondary care, the process prevents admissions in four broad categories:

- Acute exacerbations of long-term conditions;
- Relatively minor medical admissions in patients who are “at risk” due to current functional, social or psychological unmet needs;
- Patients who are unaware of alternatives to admission and prone to anxiety and panic when early symptoms present;

---

\(^3\) Regression to the mean sets a benchmark for effective practice. Some 35% of patients with multiple admissions admitted in any one year will not be readmitted in the following year regardless of any specific intervention. Over 5 years their admission rate reverts to the mean for their age group. Hence a successful case management approach needs to be demonstrating reduction in admission rates significantly higher than 35%. Ruth Boaden, Martin Roland et al *Evercare evaluation report.* September 2006. [www.medicine.manchester.ac.uk/.../NOV06%20EVERCARE%20FINAL%20REPORT.pdf](http://www.medicine.manchester.ac.uk/.../NOV06%20EVERCARE%20FINAL%20REPORT.pdf)


\(^5\) Nationally unscheduled admission rates for people over 65 were then 230 per 1000 and the Castlefields estate was over-spill housing for people originally from inner-Liverpool

\(^6\) The community matron programme has had variable results in other parts of the country.

\(^7\) Cochrane and Fitzpatrick, *Matrons are they on the Case? Health Service Journal,* December 8\(^{th}\) 2005 The key differences included more intensive training and one-to-one mentorship, plus a number of care planning, operational policies and evaluation tools.
• Adverse medical reactions due to poly-pharmacy.

For primary care, the practitioners also work with patients who are “frequent flyers” in the GP practice and for some patients are able to reduce the amount of pharmacy routinely prescribed. Castelfields monitored the social care costs which remained the same. 50% of patients needed a new or revised social care package, however for others the reablement service was able to reduce the intensity of social care required.

![HOSPITAL ADMISSIONS](image1)

**HOSPITAL ADMISSIONS**

- Hosp. Adm. Prior to CM Caseload
- Hosp. Adm. Since CM Caseload

---

**GP Visits one year after entering the programme**

![GP VISITS](image2)
Randomised Control Trial Evidence  Mindful of the critique that evidence was lacking for case management and anxious to confirm which aspects of the intervention were essential to deliver good outcomes, Prof. Chad Boul of Johns Hopkins turned his attention to the subject. Working with the US government Medicare programme and a Baltimore-based health plan he led a randomised control trial which placed a “Guided Care®” nurse with a number of primary care practices randomly selected for the intervention and measured the impact alongside “control” practices of comparative size (where no practitioner was made available). This study confirmed that practices with the Guided Care® nurses showed significantly improved quality outcomes which are reported in detail by the project. In terms of cost, the saving on inpatient care alone produced a return on investment of nearly 100%, once the costs of the service were taken into account. Subsequent roll-outs of the pilots have shown even greater savings. For example:

“Guided Care® patients in Kaiser Permanente of the Mid Atlantic States experienced, on average, 52 percent fewer (sub-acute) skilled nursing facility days, 47 percent fewer skilled nursing facility admissions, 49 percent fewer (acute) hospital readmissions, and 17 percent fewer emergency department visits; the differences for skilled nursing facility days and admissions were statistically significant.”

Guided Care® project recently won an innovations award from the British Medical Journal for Getting Research into Practice as well as a number prestigious US awards in long-term conditions and older people’s care.

(3) Potential benefits from scaling up

Typically, candidates for case management are drawn from some 5% of the population. This includes 25% of people aged over 65 and 1% of the rest of the population. For example, the Adjusted Clinical Groups (ACG) risk stratification model is pre-programmed to identify this group. In this one pilot of six practices in south-west London 2,815 patients (from a total population of 56,000) were identified as potential candidates for case management. In the calendar year 2010/11 the costs associated with this group equate to an average of 34% of all patient costs in the data-set for all 56,000 people (just under £44.5m). These patients cost the system over £14m in hospital and GP activity at an average of over £5,000 per individual patient (four or more times the average for the general population). On the basis of this data, a Clinical Commissioning Group with a total population of 250,000 can be spending over £62 million on this group alone.

---

8 Each nurse saved on average $170,000 but cost only $90,000 (staff and support systems costs). Boul, C., et al. Guided Care, A New Nurse-Physician Partnership in Chronic Care, Springer New York, 2009 and other references in www.guidedcare.org.
9 The Guided Care research and evaluation project was one of a number promoted by the US government who had decided to require all Medicare-accredited health plans to offer case management to over-65s. It proved to be one of the most successful of these versus other models which were similarly tested.
10 Other outcome measures measured included, clinician-patient communication, personalised treatment plans, patient knowledge and awareness, integration of care, and patient trust in clinical staff.
11 Guided Care Reduces the Use of Health Services by Chronically Ill Older Adults Science Daily (Mar. 15, 2011) http://www.sciencedaily.com/releases/2011/03/110314163555.htm
12 http://groupawards.bmj.com/book-seats/2010-awards
A comprehensive, best-practice and fully resourced case management programme should be aiming to reduce this total cost by 20% which is more than twice the cost of the service. (Nearly 3,000 patients would require a cohort of 15 WTE face-to-face case managers over two years which would cost between £0.75 and £1m per year.) However there would be a gross saving of £2.8 million offset by these running costs.

(4) Key lessons for best practice.

Case management of high-risk patients is a highly specialised clinical process and as such good outcomes require an evidence-based, best-practice approach. Based on the Guided Care research findings and the experience of the NHS projects, a comprehensive model requires a number of other core elements. These include:

a. Holistic (multi-domain), individualised patient assessment and planning. This starts with a discussion with the GP and moves onto a 2 hour face-to-face multi-instrument assessment using tools such as are available in the Single Assessment Process (SAP). The patient is an active partner in the development of this care plan.

b. Coordination of a multi-disciplinary approach with the case manager in a “key worker” role;

c. That clinical management of the long-term conditions is but one element of the care plan which – depending on the individual – may includes re-ablement, medicines management, social care, and/or mental health (usually undiagnosed depression);

d. Staff with the appropriate range of competencies; successful case management is a complex clinical process hence the staff need a range of competencies which span clinical management, medicines management, care coordination and motivational skills.

e. The service needs to be adequately resourced. One WTE case manager can handle a caseload of 50-70 patients at a time. The average time spent on the caseload is about 13 weeks per patient. Hence over the course of a year, a fully-trained and operational case manager should manage some 200 patients.

f. Patients within the top 5% are a not a homogenous group. Some will have needs that are relatively easy to meet whereas others will require more protracted, intensive management. Clinical experience in Castelfields and Surrey and Sussex, indicates that a “mixed dependency” caseload is beneficial to staff without diluting the level of outcomes generated.

g. Motivational work The patient needs to be fully involved and incentivised to collaborate with the programme. Given the client group, this can be one of the most challenging elements of case management to develop the self-care, self-monitoring and motivation skills of the patient and immediate carers. This can be facilitated if telehealth, self-monitoring technology is provided to patients provided the resultant data made immediately available to the case managers to support pro-active care.

13 similar to the virtual ward but perhaps with more flexible referral and dynamic discharge policies;
h. **Pro-active and preventive work**  To support sick patients achieve a degree of wellness and quality of life which prevents common causes of unscheduled admission;

i. **Primary-care-link**  The case managers need to work very closely with the patient’s GP. This involves consultation at each stage in the management process particularly:

1. **Patient prioritisation** – the predictive modelling will highlight many more patients than one case manager can handle at any one time and the GP should be consulted on who to prioritise;
2. **In the development and finalisation of the care plan**; not least the GP and other practice staff will have a key role for many patients in the preventive model of care;
3. **Impact assessment** – KPIs need to be agreed with and regularly reported to the patient’s GP.

**The role of telephonic case management**  The above projects involve practitioners initially engaging with patients on a one-to-one basis, going into the patients home before reverting to telephonic monitoring and management. There has also been one NHS-based service with good outcome data and which follows a similar approach but which is delivered entirely by telephone. The outcomes for the 23 participating GP practices compared to control practices show more than a 40% reduction in unscheduled admissions and patient satisfaction of over 90%. Telephonic services can out-turn higher productivity in terms of patient to practitioner ratios, typically 200 cases to 1 wte for multi-morbidity patients. However not all patients can be recruited into this type of service directly so that participation rates are routinely only 40% of those who could benefit. Hence a combination of face-to-face and telephonic services may constitute the optimum service design.

**5) Risk/Stratification and Predictive modelling using the Adjusted Clinical Groups System**

Predictive modelling is a data-mining and analytics process which identifies patients who are currently and in the future at high risk of using high levels of health resources due to their high clinical, psychological and social needs. Predictive modelling as a science has been developing over two decades. It originated in the United States in response to demands for more systematic case finding techniques for case and disease management. The challenge for predictive models was to predict the likelihood of hospitalisation even amongst that group in the population with hitherto no hospital admissions.

Research led by Prof Chad Boult and colleagues – now of Johns Hopkins University – identified a range of 17 risk factors which when run through an algorithm stratified people into high, medium and low risk individuals. The factors spanned clinical – diagnoses – utilisation of hospital and primary care, and psychological and social factors. This developed into the PRA Plus questionnaire which was for many years was the primary case finding tool in use in the United States. The questionnaire is self-reported, and completed by target populations under clinical supervision. The results are then run through a computer model to stratify the individuals into high, medium and low

---

14 [www.hsj.co.uk/Journals/2/Files/2010/12/1/HSJ AWARDS 2010.pdf](http://www.hsj.co.uk/Journals/2/Files/2010/12/1/HSJ AWARDS 2010.pdf)

risk with the high risk patients transferring to the case management programme. At the same time, however, a colleague of Prof. Boult’s, Prof. Barbara Starfield was developing a parallel methodology to link clinical need of patients to their resource requirements in her primary care paediatric practice. This involved mining electronic clinical and pharmacy data from the practice systems. The resultant Adjusted Clinical Groups Tool thus began as a resource and case management tool in primary care and has developed into an internationally market-lead risk stratification and predictive modelling tool bringing together the learning from both parallel innovations. Hence the predictive model (PM) element of ACGs is one of a number of clinical management and commissioning functions which can be served by mining the same primary and secondary care, combined data set. The ACG PM is as good as any on the market and in many respects offers advantages in terms of ease of use by practitioners and the ability to target specific groups of patients as resources allow. Not least ACGs tracks the use of resources in primary and secondary care by each patient and hence provides the necessary live data for monitoring the impact of any intervention on key cost parameters.

---

A Best Practice Model – PHC linked

```
Target population
First Level Screen
  Multi functional assessment
    Problem Identification
      Planning
        Intervention
          Evaluation and Monitoring
```

ACGs

---

\(^{16}\text{In the US Medicare, the federal agency which funds health care for the over-65 population, commissioned Health Dialogue to develop a predictive model for seniors. This HCC model was made available free to all health plans which qualified for and provided case management to Medicare beneficiaries. However since it is only a predictive model and lacks the wider applications of ACGs, it has not proved a significant competitor to ACGs in the US market. When the DH commissioned Kings Fund/Health Dialogue to develop a model for the NHS, it was variant of this model which was deployed as the “combined model”}^{.}

---

8
(6) Going forward

Most community matron services are not demonstrating good outcomes. However they provide a core service which can be re-designed and re-focussed relatively quickly (over 6 months). A potential programme of work would include:

- Qualitative audit of the current service against the best practice model
- Skills enhancement of community matrons – particularly in care coordination and medicines management
- Synchronizing case management with primary care, re-ablement and other social care services
- Use of the ACG tool as case finding, care planning and outcome monitoring
- Mentorship of current staff by skilled and qualified case managers
- Accreditation in Guided Care by JHU.
- Resource review to ensure appropriate productivity and return on investment.