Designing and implementing a COPD discharge care bundle – Online supplement

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Context and Research Methodology

The work described in this paper took place with patients admitted to the respiratory ward of Chelsea and Westminster NHS Foundation Trust in Central London. The NIHR Collaboration for Leadership in Applied Health Research (CLAHRC) for Northwest London is centred here. This funded research programme is an alliance of academic and healthcare organisations that aims to develop and sustain clinically driven innovative and cost-effective research based improvements to patient care and experience. A range of stakeholders in COPD care including patients, specialist and ward nurses, physiotherapy, pharmacy, physicians and smoking cessation providers where involved in the project team. The work was supported by collaboration between primary and secondary care healthcare providers through the Inner Northwest London Care Community (INWLCC) integrated service improvement program for COPD.

There are known variations in care and clinical outcomes which are not adequately explained by patient demographics.[1 2] The data from ‘Crossing the Quality Chasm’ shows the organisation of care influences outcomes.[3] This is supported by reviewing patient journeys and experiences which highlight complicated treatment pathways and that interfaces of care between different healthcare professionals and settings are where errors occur.[4] This project adopted an action research approach. Action research uses multiple research methods and is a combination of qualitative and quantitative approaches. Defined data sets are used and continually monitored so that participants are aware of the effect of their planned interventions

and are able to modify their approach on the basis of data in “real time”. The NIHR CLAHRC for NWL programme utilised an underpinning improvement model for improvement (Figure 1). This is often referred to as ‘rapid-cycle’ improvement (where a number of small PDSA cycles take place one after the other to test and implement sustainable improvement.[5]

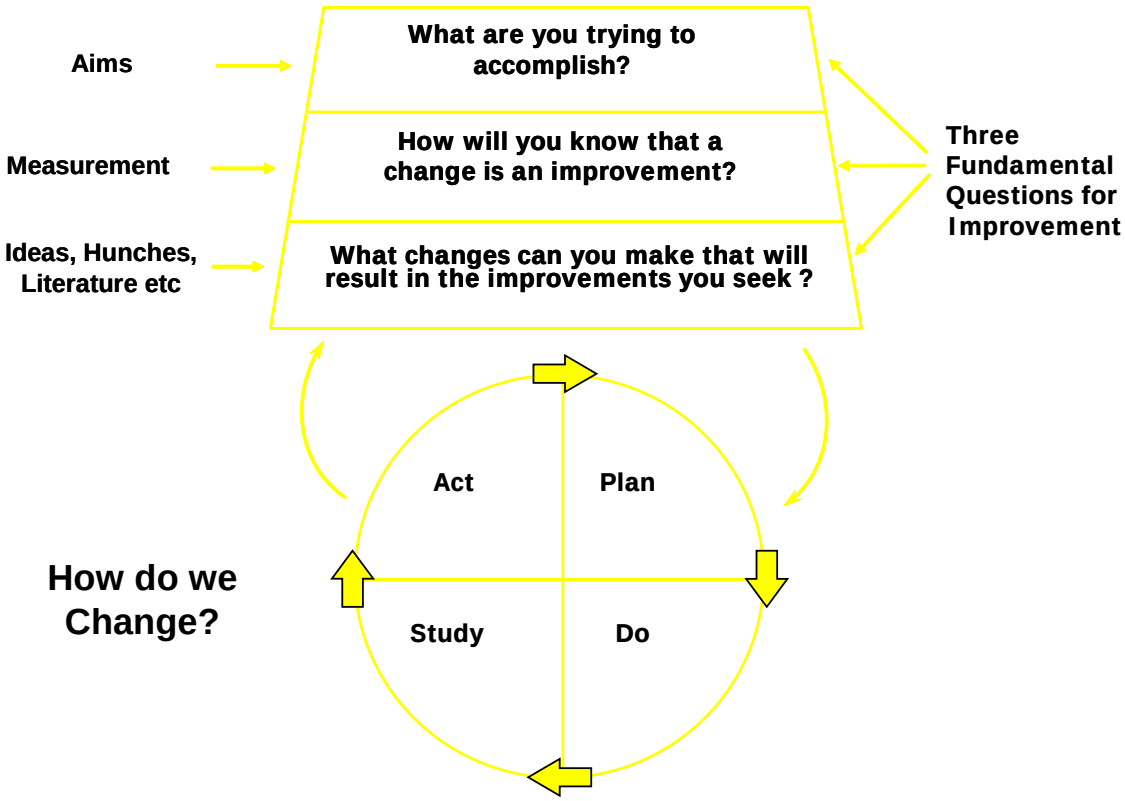

Figure 1 The Model for Improvement

Identifying items for the care bundle

Acute exacerbations of COPD (AECOPD) are the cause of 12% of acute admissions and responsible for more than one million bed days per annum in the UK with about one third of patients being readmitted within 90 days of discharge.[6 7] Significant variations in outcomes and provision of care have been noted between different acute trusts implying that there might be scope to improve outcomes by standardising the delivery of optimum care.[8 9]

Selection of items for the care bundle was initially based on national and international guidelines for the management of COPD, particularly the guidance from the UK National Institute for Clinical Excellence (NICE).[10-13] However the selection also incorporated input from other stakeholders including patients to ensure that as wide as possible a perspective was used. The involvement of staff and patients in the development process was intended to produce a benefit in terms of face validity and ownership beyond arguments based simply on published evidence and thus enhance uptake and compliance. This was important because to date, although the factors in AECOPD associated with poor outcome post hospital discharge are well described (age, prior exacerbation history, hypoxia, low level of physical activity)[14], the evidence that specific interventions can *modify* them is less strong. The potential items were discussed at several meetings within the project group, including with patient representatives, at the British Lung Foundation BreatheEasy group and at INWLCC meetings, so that the final selection was informed by the literature, expert clinical opinion and patient priorities.

Although it was usual practice for the Respiratory CNS to notify the appropriate local community COPD teams, we did not include this as a bundle item because it might not have been possible to identify the appropriate team in patients from outside the local area. Since improving transitions of care was a major objective of the program this requirement for “universality” may have led us to exclude a key item from the care bundle.

The justification for each item is outlined briefly below.

1) Notify respiratory clinical nurse specialist of all admissions.

This was included on a pragmatic basis. Most acute hospitals employ respiratory nurse specialists whose role includes the provision of expert care and support to ward nurses in the management of respiratory patients.[13] Specialist respiratory involvement in all COPD admissions is recommended by NICE and there is some evidence that involvement of respiratory specialist care improves outcomes, so this item is likely to be operationally useful.[7 15] The bundle does not however define what the specialist nurse should do. Although specialist nurses are likely themselves to engage with one or more of the bundle items, the bundle items are intended to be deliverable by all nurses and other health professionals seeing patients admitted with AECOPD. The implementation of the care bundle is intended to drive improvements in care across the patient pathway and not simply to be an audit of specialist nursing input. An important element of the clinical nurse role is to liaise with community respiratory teams, which is likely to be key in maintaining safe and effective transition of care from hospital to home.

2) If patient is a smoker, offer smoking cessation assistance.

Smoking is associated with COPD exacerbations, reduced sensitivity to corticosteroids as well as a more rapid decline in lung function and smoking cessation is a highly cost effective intervention.[7 16] Smoking cessation is one of the only interventions to improve survival in COPD and was selected as a key item for implementation in the 2010 NICE COPD guidelines.[7]

3) Refer for assessment for pulmonary rehabilitation.

Pulmonary rehabilitation is an established therapy that improves exercise capacity and quality of life in patients with COPD both in trial populations[17] and in routine clinical practice.[18] PR can reduce hospital admissions and health care costs.[7 19-23] Low physical activity is associated with an increased risk of hospital admission in COPD[24] and exacerbations themselves lead to a dramatic reduction in physical activity[25] and health status[26] which can be prolonged, reflected in reduced time spent outdoors.[27] In addition, activity limitation is associated with a greater likelihood of relapse after discharge following ER attendance.[28] PR promotes patient education and empowerment and two studies have shown substantial benefits for early PR in terms of exercise capacity, quality of life and hospital admission.[19 29] Recovering physical function was identified as a priority by patients involved in the care bundle project.

4) Give written information about COPD including British Lung Foundation (BLF) self management booklet, oxygen alert card and information about patient support group (BLF BreatheEasy Group).[7]

The report of the 2008 National COPD audit found that there were “serious deficiencies in the provision of information to patients across all COPD services.”[13] There is some evidence that education programs alone can have an impact on admissions.[30] The provision of written information for patients to consult after discharge including self management advice and contact details for patient support groups was intended to address patients’ reported need for more information about their condition. Engagement with patient support groups could also help to address social isolation. Patients reported a lack of certainty about their management and in addition going through written material with patients also provides an opportunity for staff to develop and maintain their own knowledge and areas of uncertainty. There is a Grade A recommendation in the NICE COPD guidelines that patients at risk of patients at risk of having an exacerbation of COPD (which of course includes patients who have been hospitalised with an AECOPD) should be given self-management advice that encourages them to respond promptly to the symptoms of an exacerbation.[7]

Oxygen alert cards are important as morbidity due to excessive oxygen administration is a well recognised but still common problem in patients admitted with AECOPD and respiratory failure.[31]

5) Demonstrate satisfactory use of inhalers.

Incorrect inhaler use is widespread and attention to this area is recommended in the NICE COPD guidelines.[7 32] There should be multiple opportunities to review and correct inhaler technique during the course of a hospital admission and the inclusion of this item stresses the need for all ward nurses to be able to identify errors in

inhaler use and be empowered to help patients to correct there technique. Staff surveys found that confidence in this area was low.

6) Follow up appointment to be made with specialist prior to discharge.

The NICE COPD guidelines recommend that patients be followed up after AECOPD.[7] Having follow up arranged prior to discharge ought to reduce the feeling of a lack of support that patients identified. Since median readmission occurs at 38 days following discharge from hospital[13] the consensus position was that follow up needed to occur before this if it is to be possible to identify and/or intervene where there is deterioration.

Interpretation of initial outcome data

The major purpose of the care bundle is to improve delivery of identified key elements of care that have an evidence base to support them. Having developed this we wanted to pilot its implementation using action research methodology with a rapid feedback mechanism regarding problems with implementation so that these could be addressed in real time. The principal objective was to demonstrate that the process of care could be improved, so process measures and practical issues around administration of the bundle items are the focus of the present report. An initial survey established poor compliance with the bundle items, whereas this was much improved following bundle initiation. We also tracked 30 day readmission rate since this is an important and clinically relevant outcome that may be sensitive to an overall improvement in the quality of care. Appropriate inhaler use, smoking cessation and pulmonary rehabilitation as well as better patient knowledge might all

have been expected to contribute to a reduced risk of readmission. Although the trend is for a reduction in readmission rate following bundle initiation this is not significant and cannot at this stage be used as evidence of the care bundle's effect on this particular outcome.

Sample size

Segmented (or piecewise) probit regression was used to assess the trend in readmissions both before and after the implementation of the care bundle. Piecewise regression allows multiple regression models to be fitted to data at different periods in time, so for this analysis a separate regression was run both before and after the implementation of the bundle, and the trend in readmission rates did not differ significantly between time periods. A post hoc power calculation suggests that in order to have 85% power to detect a difference of this magnitude (5.6%) this would require close to 750 receiving the bundle and 750 not receiving it. Studied prospectively, 450 patients would be required in each arm to have an 80% power of confirming a difference in one month readmission rates of 10.8% vs 16.4% - the readmission rates identified in the present study in patients where the care bundle was or was not administered.

Future development of the care bundle

Following the pilot study described here, implementation of the care bundle is being rolled out to a number of other hospitals within the region. At each site the bundle items have been retained, but some differences in implementation to meet the requirements of the local health economy have been made. For example, the precise provision of post discharge phone support will vary depending on the availability of

early supported discharge programs. In addition, having been piloted on the respiratory ward at Chelsea and Westminster it will now be implemented in this and other hospital's acute admissions unit. As data from further sites becomes available the data will become available for a more quantitative evaluation of the link between these process measures and outcomes using techniques such as statistical process control to link bundle compliance with variation in outcomes such as patient satisfaction and readmission rate.

The care bundle has been adopted by NHS London as one of the items that commissioners can select as part of the Commissioning for Quality and Innovation (CQUIN) payment framework.[33]

Table E1

Care Bundle Patient characteristics

Age (yrs)	74.6(11.2)
Sex (M/F)	60 / 34
Length of stay (Median)	6

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