Improving Home Oxygen Services: Emerging Learning from the National Improvement Projects
Patients and their carers are the reason the health service exists and therefore they should be at the heart of our services. Service redesign and improvement generates opportunities to involve service users who will provide a different perspective on the service, so that we can better understand whether our service or improvements make any difference to the patient.

Only when we understand patient’s needs – by asking them, not second guessing – can we work in a way that meets those needs and ensures they get maximum benefit from our service.
# Improving Home Oxygen Services - Emerging Learning from the National Improvement Projects

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Foreword

Since July 2010, NHS Improvement – Lung has worked with a number of clinical teams across England as part of the Department of Health Respiratory Programme. Its aim has been to support the development of patient centred, evidenced based and clinically led services by identifying and sharing innovative ways to reduce variations in care and improve the quality and experience of patients with chronic obstructive pulmonary disease (COPD).

The national improvement projects have tested approaches at key stages of the clinical pathways which have included:
- Improving home oxygen services
- Early accurate diagnosis
- Transforming acute care
- Managing COPD as a long term condition
- Improving end of life care

Following the first six months of the improvement programme, this publication signals the mid-way point in the project cycle and has been written to share the learning from the testing phase of the work. Through a series of case studies and examples, it aims to highlight areas of innovative and emerging good practice that can be used locally to deliver improvements for COPD patients and their carers.

In order to address the paucity of current evidence, particularly around the models and principles of implementation, the programme will continue to adapt and refine the learning. However, these lessons will be of value now to any team working to improve the care it delivers and commissions for people with COPD.

This publication contains a number of examples that demonstrate value for money, increased productivity and approaches that can sustain improvements over the long term.

The publication also contains information for healthcare professionals and those working in commissioning or interfacing with COPD services. This includes those who are:
- Involved in the care of patients who require COPD services
- Responsible for commissioning COPD services
- Managing COPD services
- Local or regional leads

The project sites were encouraged to employ a range of service improvement tools and techniques. These included process mapping, demand and capacity and data analysis, the application of Lean principles, process redesign and the human dimensions of change. NHS Improvement - Lung also supported the testing of new ideas and pathways through site visits and project team peer support.

There are lots of practical examples within this report to support clinical teams in delivering quality and productivity benefits to patients and a wider range of stakeholders. Over the next six months, NHS Improvement – Lung will continue to test the key principles for change and implementation. As this learning emerges, it will be shared with COPD services and the wider NHS.

We would like to take this opportunity to thank the project sites for their hard work, dedication and commitment and look forward to the full extent of the improvement work as it comes to fruition.

Professor Sue Hill
Dr Robert Winter
Joint National Clinical Directors for the Respiratory Programme
Executive summary

National position and workstream context

Home oxygen therapy is provided to about 85,000 people in England at a cost of approximately £110 million a year.

Many Primary Care Trusts (PCTs) do not undertake quality assured clinical assessment and review of their patients need for long term home oxygen increasing the potential for poor quality care and waste.

The Department of Health estimates that around 30% of people prescribed oxygen either derive no clinical benefit from it or do not use their oxygen. Quality and productivity in the home oxygen service can be improved significantly. Gross savings of up to 40% - equivalent nationally to £45 million a year, or £300,000 per PCT can potentially be achieved according to recent analysis carried out by the Department of Health through the established of home oxygen services and oxygen register review and formal clinical assessment.

The rationale for the work of the project teams is provided by recommendation 14 of the Chronic Obstructive Pulmonary Disease (COPD) Strategy Consultation document, which states:

‘All people with COPD and hypoxaemia should be clinically assessed for long-term oxygen therapy and reviewed at regular intervals, and existing home oxygen registers should be reviewed’.

Thus the overarching aim of this workstream is that patients receive accurate quality assured oxygen therapy through optimised assessment and review models which ensure the right people are in receipt of the right dose of oxygen therapy.

In developing the project outline the scope of the project work was framed such that teams would consider:

- The most appropriate (competent) staff to undertake assessment and reviews
- Assessment and review location settings
- Guidance on correctly documenting and interpreting diagnostic results
- Guidance on accurately prescribing oxygen
- Providing the patient with written information regarding their oxygen therapy

The project teams made extensive use of British Thoracic Society Home Oxygen Services Standards and early drafts of the Department of Health Good Practice Guide. In addition to the above the project teams have also utilised the work of NICE and IMPRESS to inform their thinking.

Summary of emerging learning

Early indications are that the project work spans three phases:

1. Data review and data management
2. Establishment of a formal assessment service
3. Service integration and sustainability

This has led to a workstream 1/3 Rule Savings, testing a hypothesis which states:

‘One third of the total cost efficiencies (savings and avoidance) can be realised through the first phase of a three phase process with efficiency gains reaching a plateau and prescribing costs capped by implementation of all three phases.’

Placing an emphasis on the assessment of clinical need, and ongoing clinical review, provides an opportunity for healthcare professionals to more comprehensively inform and educate patients about their condition. In addition if home oxygen therapy is deemed appropriate then this interaction also facilitates patient education about equipment use, risk and their own responsibilities as regards the safe use of oxygen at home.

Project teams will use or develop easy-to-read, quality literature to educate patients about the appropriate use and potential (fire) safety risks associated with using oxygen at home.

This educational process is in alignment with recommendation 11 of the Chronic Obstructive Pulmonary Disease (COPD) Strategy Consultation document, which states:

‘Good-quality information should be provided at diagnosis and delivered in a format that any person can understand’
Some emerging themes arising from the work to date include:

- **Data coordination** - Clinical team access to data and collaboration between clinical and managerial/administrative staff to review/challenge oxygen patient data.
- **Consistent messages to patients** - In rationalising local oxygen services project teams have been engaging GPs and other healthcare professionals (HCPs) to develop a consensus in respect of the appropriate initiation of home oxygen therapy for COPD patients. This is often summarised by the simple message that ‘oxygen is not a treatment for breathlessness’.
- **Service integration** - This is achieved by developing a pathway and prescribing consensus between the home oxygen service assessment and review (HOS-AR) team, GPs, commissioners and non respiratory specialists. This leads to the alignment of the HOS-AR service specification within a wider respiratory care pathway and improved patient safety risk assessment which is enshrined within a wider (PCT) governance framework.

**Summary of site projects**

**NHS Newham and Newham University Hospital NHS Trust**
Established a system of oxygen usage data coordination and review in order to control prescribing costs and performance manage suppliers. In addition, they introduced systematic review of existing acute hospital oxygen clinic patients and developed plans and protocols for future integrated home oxygen service - assessment and review (HOS-AR) spanning primary and secondary care.

**Royal Free/Waltham Forest PCT/NECLES HIEC**
Introduced a review of all COPD short burst oxygen therapy (SBOT) prescriptions in the Waltham Forest PCT area offering patients full assessment of their requirement for long term oxygen and counselling or advice on alternative interventions for the management of breathlessness and the supported withdrawal of the oxygen supply.

**West Hertfordshire COPD Service**
Introduced a system of identifying healthcare professionals inappropriately prescribing home oxygen to patients with normal oxygen levels and undertaking targeted group education around good practice in prescribing.

**NHS Sheffield**
Developed a detailed business case and service specification for integrated HOS-AR in line with best practice. In addition, they introduced a system of oxygen usage data coordination and review in order to control prescribing costs.

**NHS Hull/City Health Care Partnership**
Introduced a new commissioned HOS-AR service and so the project work provided an opportunity to monitor improvements to the delivery of appropriate and cost-effective oxygen therapy to COPD patients and develop safety protocols and procedures through a multi-stakeholder project group.

**Milton Keynes PCT Community Services and Milton Keynes Hospital**
Introduced pre and post of clinic set up evaluation for the ambulatory oxygen assessment clinic and also a quality patient questionnaire pre and post use of patient information leaflet to see if patient experience improves.

**NHS Blackpool**
Developed an accurate oxygen usage register and systematic use of data to manage performance and extended formal assessment and review by the introduction of HOS-AR based within a community setting.

**Wirral Integrated Oxygen Service**
Developed oxygen care pathways for non COPD patients in collaboration with non respiratory specialist colleagues. In addition, they developed systematic risk escalation procedures and protocols.

**Sherwood Forest Hospitals and NHS Nottinghamshire County Community COPD Team**
Established multidisciplinary HOS-AR within a community setting and collaborated with GPs and PCT managers to review oxygen usage.
Executive summary

NHS South Staffordshire
Demonstrated the quick win potential of systematic review of oxygen usage data in order to re-categorise costing and alter therapy to achieve prescribing efficiencies within one locality. This approach will now be extended across the PCT.

NHS Birmingham East & North and Heart of England NHS Foundation Trust
Introduced transparent systems for sharing information relating to home oxygen users across the local health economy and a pathway with guidelines supporting the process of initiating oxygen therapy for new patients and withdrawal/cessation where appropriate.

Quality, Innovation, Productivity and Prevention (QIPP) and expected outcomes
The demand for services is increasing and there are areas where we could increase the quality, efficiency and value for money of services as well as improving outcomes for people with chronic obstructive pulmonary disease (COPD). Focus needs to be centred on these three factors to make this a reality. First, improving quality whilst improving productivity by enforcing the principles of the Quality, Innovation, Productivity and Prevention (QIPP) agenda by using innovation and prevention to drive this forward and interlink these values. Secondly, having local clinicians and managers working together in a multidisciplinary approach and across boundaries in order to spot the opportunities and manage the change. And thirdly, to act now, for the long term.

The goal is to achieve efficiency savings of up to £20 billion for reinvestment over the next four years. This represents a very significant challenge to be delivered through the detailed work the NHS has already undertaken on Quality Innovation Productivity and Prevention (QIPP) programme and the additional opportunities presented in the Equity and Excellence: Liberating the NHS.

In relation to the QIPP challenge, the NHS has been developing proposals to improve the quality and productivity of its services since the challenge was first articulated in May 2009. The proposal is to ensure that the NHS continues to make quality improvements a reality during a period in which growth in expenditure within the NHS will be restricted despite increasing demand.

Many of the measures outlined in this document are designed specifically to support the NHS to meet the QIPP challenge, either by identifying where resources might be released or by improving understanding of the key interventions that have greatest effect.

The work has demonstrated that the annual total spend across nine project sites can be reduced by a minimum of £600k. This applies for both new and established home oxygen services who implement oxygen usage reviews and therapy optimisation. On a national scale, the work compliments the Department of Health estimated gross savings of up to 40% for each PCT.

The expected outcomes in these project sites will be:
- **Minimum of £600k prescribing savings** - achieved through therapy rationalisation, list cleansing, avoidance of inappropriate prescribing and withdrawal of clinically unnecessary therapy
- **Introduction of HOS-AR** - establishing a cycle of assessment and review, improvement of an existing service to the standard articulated within the Good Practice Guide, introduction of a new service to a locality in which HOS-AR currently absent
- **Patient education packages** - safety and risk considerations explained to patients and carers, captured within easy-to-read literature and mutual responsibilities (both patients and healthcare professionals) understood and documented within local agreement documents
- **Pathways for the treatment of non COPD patients on oxygen** - engagement of generalists and non respiratory specialists to establish optimal care pathways for non COPD patients in need of home oxygen therapy
- **Principles of a good service model** - development of new ways of working by examining use of different types of workforce along the pathway in different settings
- **Effective use of data** – collaboration between clinical and managerial professionals to integrate, review and interpret financial, administrative and clinical data in order to optimise care, rationalise prescribing, oversee governance and performance manage the oxygen suppliers

Potential for future work
The initial quick win cost efficiencies attributable to the first phase of HOS-AR improvement work (data review and data management) are becoming self evident. However, more work is needed to conclusively establish that the 1/3 Rule Savings hypothesis has been verified, specifically in relation to the cost efficiencies realisable from the establishment of HOS-AR and by its integration within the broader service commissioning framework.
In addition, further narrative is needed around the demonstrable benefits in quality of care patients may derive from optimised home oxygen therapy. The effective use of administrative, financial and clinical data relating to oxygen usage further promotes the use of disease registers and flags up opportunities for more effective patient record linkage.

An identified gap in the current work is establishing whether or not improved care resultant from formal oxygen assessment and review results in fewer admissions to hospital. Although initial workstream metrics were devised to explore this, linking information about individual patients in receipt of home oxygen with information from hospital patient administration systems continues to present a challenge.

The reasons why a patient with COPD is admitted to hospital are varied and in addition COPD patients on long term oxygen tend to have more severe disease and thus increased risk of hospitalisation. As such it may not be possible to establish whether optimised home oxygen therapy resultant from systematic clinical assessment and review is an effective admission avoidance strategy. However, this topic is certainly worthy of more consideration in future.

Many HOS-AR teams have begun to establish effective dialogue with non-respiratory specialists in respect of the management of non COPD patients in receipt of home oxygen therapy. As those relationships mature, the HOS-AR teams have been able to explore with their non respiratory colleagues the reasons for initiation of home oxygen therapy in non COPD patients, often challenging colleagues when they appear not to be adhering to their own specialty area guidelines. Thus there may be scope for future projects to more thoroughly investigate the potential cost savings achievable from rationalisation of home oxygen therapy in non-COPD patients.

Future work will also thoroughly explore and test ‘how to’ implement a gold standard pathway of HOS-AR as defined by the Good Practice Guide in terms of new services, but also in relation to driving up quality for existing services.

Finally, further consideration will be given to the following areas:
- Stakeholder engagement
- Developing local incentives to commission HOS-AR
- Varying the workforce employed at different parts of the pathway
- Describing optimal models of care in urban/rural geographies
- Developing a consensus around provision/withdrawal of home oxygen to persistent smokers who have a clinical need for oxygen
- Establishing ownership of HOS-AR governance and performance management within the emerging commissioning structures
Emerging Learning

Phases of work
In attempting to broadly categorise the type of work being undertaken by the 12 ‘improving home oxygen services’ national project teams it has been useful to think in terms of three phases:

1. Data review and data management
   - Data access
   - List cleansing
   - Invoice reconciliation with concordance reports
   - Case prioritisation

2. Establishment of a formal assessment service
   - Address assessment backlog
   - Establish assessment and review cycle
   - Therapy modifications
   - Withdrawals
   - Education

3. Service integration and sustainability
   - Robust referrals
   - Multidisciplinary team process mapping resulting in agreed pathway
   - Demand matches capacity
   - Service specification aligned with governance and commissioning
   - Effective communication with healthcare professionals, patients and carers

In reality, many project teams have undertaken activities in parallel and so may span these phases which are now outlined in more detail.

Data review and data management
The overwhelming message from all national chronic obstructive pulmonary disease (COPD) project sites in all workstreams (not just oxygen) when starting improvement work was that there was difficulty in getting hold of data and information. As the COPD projects commenced, sites reported limited access to data on their day to day activity, and very poor access to overall information covering the respiratory pathway.

Fortunately, there are many resources available that can support COPD project sites understand and compare their local respiratory services with others, and many of these are freely and easily accessible.

Local data on oxygen can be combined with nationally available data on secondary care and primary care in order to build up a picture of local services.

Why is data important?
Data and measures are important to demonstrate that change has occurred or needs to occur. NHS Improvement - Lung focuses on the delivery of quality measured improvements which are aligned to national priorities and strategies. In line with the national Quality Innovation Productivity and Prevention (QIPP) initiative, it is essential that all system changes are measured and recorded. Whether the change was a success or did not demonstrate the anticipated outcomes, you still need to demonstrate its effect and learn from it.

Don’t forget ‘better’ is not measureable. ‘More’, ‘faster’, ‘safer’ or ‘cheaper’ can all be measured but only if you know how many, how fast, how dangerous or how expensive things were to begin with. We need to establish factual data and measures to demonstrate what has been achieved.

How did oxygen sites work with data?
Project teams grappling with this phase spent much of their time ensuring all appropriate staff had access to the full range of information available and then developing effective ways of utilising this information in order to understand and modify local processes and ensure financial control.

This included information provided by oxygen suppliers and or PCT/regional home oxygen service (HOS) leads in the form of quarterly concordance reports, monthly invoices, copies of completed home oxygen order forms (HOOFs) and bespoke performance reports.

In order to provide oversight in respect of both clinical appropriateness and financial control it is necessary for clinical members of the home oxygen service assessment and review (HOS-AR) team to be able review individual patient details contained within the completed HOOFs received by the oxygen supplier.
Gaining access to home oxygen order form data

NHS Connecting for Health provides designated users (authorised by individual PCTs) on-line access to individual patient HOOFs held on the National Health Applications and Infrastructure Services (NHAIS) system database via Open Exeter a web-enabled viewer.

New users have to complete a Data Users Certification Form (available from www.connectingforhealth.nhs.uk/nhais/products_and_services/vaprodopenexe) and get the form authorised by the PCT (or shared services agency) data controller who will then process the form on-line or forward it for authentication.

Getting access to oxygen cost data

In addition to Open Exeter, the majority of PCT home oxygen service leads and medicines management teams have access to on-line home oxygen therapy reports from the NHS Business Services Authority Prescription Pricing Division (NHSBSA PPD).

These reports provide information on the payments made to suppliers for provision of oxygen and differentiate payment claims made for the supplier in respect of patients residing within the contracted PCT area and claims for out-of-area patients.

Access to these reports is obtained by completing a PCT prescribing reports user registration form and sending it a signed letter from the PCT senior officer to Information Services Department of NHS Prescription Services in Newcastle. www.nhsbsa.nhs.uk/PrescriptionServices/3091.aspx

Implementing ongoing monitoring for oxygen

The NHS Home Oxygen Service Manual states that in order to effectively monitor activity within the home oxygen service, PCTs need to have in place a system capable of capturing a range of information about each patient on receipt of oxygen, specifically:

- Who oxygen was ordered for
- Date of birth
- NHS number
- Patient’s GP practice
- Who placed the order
- When was the order placed
- What was ordered
- Urgent, next day or standard supply
- Primary or secondary supply
- Flow rate
- Hours per day
- Status (new or existing patient)
- Estimate of cost

The Wirral and Milton Keynes project teams have each had to independently develop local ‘databases’ which enable the HOS-AR team to monitor service activity but with limited ability to link information from other clinical recording sources to specific oxygen data sources.

A key component of their work has been to establish a system of HOOF management which ensures that there is either a centralised or a coordinated approach to HOOF completion and that copies of all HOOFs are available for the clinical specialists to review.

Data reconciliation

Open Exeter enables the reconciliation of monthly files of invoices from the Home Oxygen suppliers against the patients recorded in their NHAIS system.

The system uses information contained within the completed HOOF to calculate the appropriate cost band from the specified delivery mechanism, the number of litres/hour and the duration and this can be checked against the cost band invoiced by the supplier.

Open Exeter has a suite of reports which support data reconciliation:

- Deducted patients by
- Patients not found on the NHAIS
- Inconsistent cost bands
- Identical provisions for patient at same address
- Cost band totals by practice
- Holiday orders
- Emergency
- Light weight ambulatory orders
- HOOF entered but not matched to a supplier order record
- No HOOF entered for supplier order record

The improvement stories from the Hull, Sheffield, Sherwood Forest and Blackpool project teams are all examples of how clinical team members developed an understanding of the prescribing cost categories.

They also illustrate clinical and non-clinical colleague collaboration in order to undertake the almost forensic analysis of modalities of oxygen supply associated with individual patients.
Armed with this information the clinicians were able to work alongside other non-clinical colleagues in order to:

- Identify patients in receipt of oxygen who are not known to the specialist team
- Reconcile invoice information with information held on local systems
- Review patients on multiple modalities
- Scrutinise the various charge bands
- Ensure deceased patients were removed from lists
- Stop charges arising from the supply of oxygen to patients living outside the PCT catchment area
- Set up patient recall and review systems
- Identify non-usage, under-usage, over-usage
- Identify sources of inappropriate prescribing within both primary and secondary care

**Data management and QIPP**

The NHS Newham project team cite their use of the Open Exeter reporting function in validating monthly supplier costs and realised productivity savings of £12,057 from April to November 2010 purely from accurate data management.

This included removal of deceased patients, removal of duplicated patients and removal of out of area patients.

The South Staffordshire project team have illustrated the quick win productivity gains achievable through primarily this first phase of work.

This team joined the programme five months into the first phase of the project cycle and over the course of two months undertook an inspection of individual patient oxygen usage data (and other recorded clinical information) for 91 Cannock Chase locality patients known to the community COPD team.

The data inspection was coupled with telephone patient contact and face-to-face review in a limited number of instances.

As a result, 10% of patients were moved to a less expensive tariff with forecast individual savings in excess £1,000 per year, the total annual forecast cost savings attributable to the review of the 91 patients in Cannock Chase locality amounted to £57,573.

Cannock Chase is only one locality within South Staffordshire and so the PCT is exploring whether even greater productivity gains can be achieved if this approach was spread to other localities.

**Establishment of a formal assessment service**

This work centres on trying to ensure that all patients currently in receipt of oxygen are receiving care management in alignment with published standards on assessment and frequency of review.

Following the data exercises undertaken in phase one it is possible to identify in receipt of oxygen but unknown to the specialist team.

Using this information together with information about the existing specialist team caseload and the volume of new referrals for a formal assessment. Some analysis of demand and capacity can be undertaken in order to inform clinic scheduling/home visits necessary to address the backlog of previously unassessed patients.

These patients are contacted by the project team in order to arrange if necessary a review and therapy altered or withdrawn if deemed inappropriate.

This phase involves liaison with the patient’s GP surgery as many existing oxygen patients received therapy as a result of a GP completing the original home oxygen order form (HOOF).
The Department of Health Good Practice Guide sets out very clearly and comprehensively the gold standard pathway for oxygen assessment and review. A condensed summary of the pathway is set out below:

1. Referral to formal assessment service following determination of hypoxaemia using pulse oximetry (SaO₂ level is below 92%)
2. Full assessment for long term oxygen therapy (LTOT) including spirometry and measurement of arterial blood gases (with LTOT prescribed for 15 hours per day in clinically stable patients where the arterial blood oxygen measurement is at or below £7.3k per annum, or under £8k per annum if oedema present)
3. Determination of safety, flow rate and duration of oxygen for patients in whom oxygen is indicated
4. Further assessment (if appropriate) to determine the patient’s capacity for exercise, and whether they should be prescribed additional ambulatory oxygen
5. Clinician orders appropriate oxygen supply device from oxygen suppliers following discussion with patient
6. Follow-up home visit should be undertaken at four weeks by a healthcare professional to assess the patient’s clinical status, compliance with the oxygen therapy regime and to determine whether further action is necessary
7. Regular clinical status reviews should be undertaken
   a. Every six weeks after admission or exacerbation
   b. Every six months oximetry should be carried out
   c. Every twelve months patients should have their arterial blood gases measured.

Models of service: The clinical teams within this initial cohort of oxygen projects are varied in terms of their locations and workforce composition.

The Sherwood Forest team operate a model which involves specialist assessment available from community clinic locations.

The Wirral project team operate from specialist clinics and more recently have begun undertaking clinical reviews from within GP surgeries in order to evaluate this approach in terms of reducing the number of patients who fail to attend their scheduled consultation.

The Newham project team are developing a mixed model which utilises both secondary care specialists and community matrons at different points within the care pathway.
The choice of model being tested and developed often reflects the geographical considerations of the area with Acute Hospital clinics being the locations of choice within the more compact and highly urbanised Birmingham setting in contrast to community clinic settings being considered by more dispersed populations such as NHS Gloucester.

At a recent peer support meeting the 12 national project teams reached a consensus as regards models of service delivery which is encapsulated within the phrase ‘Varied models but standardised processes’. This means strict adherence to best practice as articulated within the Department of Health Good Practice Guide but flexibility in respect of location and staffing.

Service integration and sustainability

A number of the project teams are attempting to leverage the oxygen cost savings achieved through rationalisation of processes to raise the profile of oxygen services among local commissioners.

In areas such Sheffield and Gloucester the type and scope of oxygen service was not previously well defined within local respiratory service specifications. The project team were subsequently given an opportunity for the local health economy stakeholders to collectively address this by utilising the emerging learning from the project work and the Department of Health Good Practice Guide to inform new business cases or revise service specifications.

The quick win cost savings achievable by undertaking phase one work is obviously attractive to commissioners but the more established teams such as the West Hertfordshire COPD service are also attempting to ensure sustainable financial management by educating GPs about the benefits of formal assessment.

Teams such as the Wirral COPD and Home Oxygen Service are engaging non-respiratory specialists in discussions around the care pathway for patients receiving oxygen for non COPD related conditions and jointly developing care pathways.

Having achieved significant therapy changes and therapy withdrawals among existing oxygen patients, through the work of phases one and two, teams such as Hull and Wirral have begun to tackle the challenge of addressing therapy modification in patients who resisted all initial invitations for clinical review and ensure patient safety risks uncovered by the earlier work is documented and integrated within the wider organisational risk management framework.

The Birmingham East and North team are ensuring that safety risk recording and follow-up procedures are firmly established within the existing PCT governance framework in order to ensure transition to the newly emerging GP commissioning consortia.

However, the risks are not just those associated with patient safety, there are also financial risks posed by poor data management and coordination.

Project teams such as Sherwood Forest are devolving oxygen prescribing budgetary management to GP localities in order to preserve the discipline of financial management during the local NHS transition and further engage GPs in discussions around the care pathway.

In attempting to establish a more integrated model of care, teams have had to overcome perverse incentives within ‘Payment by Results’ which might potentially encourage duplication, redundant processes or unnecessary steps in pathway.

Birmingham East and North are developing a local payment tariff which will encourage multidisciplinary working by both being fair compensation to the service provider and financially sustainable by the commissioner.

In developing a new service or model of care it is important to ensure clarity at the outset in relation to costs. Involvement with this programme of work enabled NHS Gloucestershire to significantly re-evaluate their business case.

The NHS Improvement - Lung senior analyst was able to guide them on how to use their own quarterly concordance report data to understand potential patterns of service demand.

In addition, the Gloucester project lead was able to review the service specifications of more established teams and through interaction with colleagues during regular peer support meetings gain greater insight in to workforce considerations.

This dialogue also enabled previously unconsidered ‘hidden costs’ (such as equipment upkeep) to be identified.
Testing hypothesis
Cost savings have been achieved by a number of project teams. Teams such as Sheffield, South Staffordshire (Cannock Chase locality) and Newham have realised significant quick win cost savings attributable to the first phase of work with forecast annual savings of £120K, £57.5K and £12K respectively.

Whilst project teams with more established HOS-AR teams such as Hull, Wirral and West Hertfordshire either continue to achieve a reduction in spending (as compared with the period prior to the service being established) or experience very modest fluctuations in month-on-month costs.

The following hypothesis is now being tested by the workstream:

1/3 Rule Savings: one third of total cost efficiencies (savings and avoidance) realised through first stage of three stage process with efficiency gains reaching a plateau and prescribing costs capped by implementation of all three stages.

Emerging themes

Data coordination – In order to ensure tight financial control and appropriate oxygen prescribing the home oxygen service - assessment and review (HOS-AR) team need to liaise effectively with managerial and administrative staff to jointly review information contained within oxygen supplier concordance reports and monthly invoices.

Collaboration between designated PCT home oxygen service (HOS) leads and HOS-AR teams has enabled supplier reports to be used effectively, picking up anomalies within prescribed oxygen and challenging unnecessary multiple modalities.

Consistent messages to patients – In rationalising local oxygen services project teams have been engaging non-respiratory specialists, GPs and other healthcare professionals in order to develop a local consensus in respect of oxygen therapy initiation.

Much of this engagement has taken the form of education in respect of the benefits of formal assessment, the health and safety considerations and waste incurred by inappropriate prescribing.

Project teams have identified that inappropriate prescribing occurs in both primary and secondary care and so teams such as the West Herts COPD service undertook targeted educational visits as part of their cost avoidance strategy.

During the periodic peer support meetings facilitated by NHS Improvement - Lung the 12 project teams jointly identified two simple messages that all project teams need to reinforce within their local health economy, these were:

i) Oxygen is not a treatment for breathlessness

ii) Think oxygen/think of us - your home oxygen service!

Service integration - As with many other areas of healthcare the project teams are confirming that sustainable models of care require an integrated approach across primary and secondary care as well as across medical specialties.
Having undertaken a comprehensive process mapping of the existing patient journey, project teams such as Newham are exploring new ways of working for their community and acute based staff on the basis of standardised assessment and review processes undertaken by different staff groups, matching competencies identified within the Department of Health Good Practice Guide10 to specific parts of the care pathway in different settings.

A number of project teams (Birmingham East & North, Blackpool, Sheffield) are looking at different ways of using hospital tariff costs in order to support multidisciplinary working and sustain service enhancements.

For many teams the project work has provided an opportunity to strengthen links with oxygen suppliers, local fire services, PCT executive committees, social services and emerging GP consortia especially with regards to patient safety governance issues.

Both the Wirral team and the team from Hull have developed local therapy withdrawal protocols and risk escalation procedures in collaboration with other local stakeholders and sought the approval of local governance committees.

Teams such as NHS Gloucester, aspiring to establish a new HOS-AR service have been able to better inform their business cases and service specifications with real world intelligence from the established HOS-AR teams within the project cohort, strengthening these documents in respect of the data support required and building-in ongoing ‘hidden costs’ in respect of equipment.

Issues and challenges

Data access/use/coordination
A number of project teams had to overcome barriers in order to access directly patient data held by the supplier. Suppliers often expressed great reluctance to share information with personnel other than the designated PCT HOS lead and many protracted discussions and emails had to be engaged into in order to unearth information.

The lack of a national database which contains both clinical and administrative information and which could be jointly accessed and populated by both clinical and administrative staff is a bug bear for many teams resulting in some teams attempting to devise their own systems locally.

This lack of record-linkage functionality impairs a joined up study of a patient’s whole system care.

Gaining agreement around the HOS-AR team acting as HOOF gatekeeper OR ensuring coordination of HOOF completion across a local health economy is something that requires specialist teams to invest time in engaging with local GPs and non-respiratory specialists on an ongoing basis to ensure harmonised prescribing.

Access to specialist information support (Trust or PCT based) appears very variable with many teams experiencing challenges around data collection and analysis.

Governance
Many of the project teams expressed a strong desire for central guidance in respect of healthcare professional liability and the legality of therapy withdrawal.

Project teams have utilised clinical guidance from a number of sources and they have engaged local governance stakeholders in order to frame a consensus around withdrawal protocols, risk assessment and escalation procedures.

Despite this many project team members expressed a sense of ‘exposure’ especially in the face of challenges from either a patient, relative, carer or even another healthcare professional.

A particular area of concern is the withdrawal of therapy in hypoxic patients who smoke. The project teams welcome the references made to this topic in the most recent draft of the Department of Health Good Practice Guide10 but feel the topic is worthy of further discussion nationally.

During recent peer support meetings the 12 project teams jointly agreed some top-tips in respect of facilitating oxygen therapy withdrawal in patients deemed a fire safety risk:

- Offer patient intensive step-up smoking cessation support
- Utilise a multidisciplinary approach including social services
- Consider possible child protection issues where patient is also a carer (e.g. smoking grandparent who regularly looks after grandchildren)
- Undertake both a risk assessment and a (mental) capacity assessment if appropriate
- Instigate a case conference around unmanageable risks
- Document all the facts
- Consider the use/development of a red card warning system prior to withdrawal
Improving the prescribing and ongoing management of patients on home oxygen therapy

NHS Newham and Newham University Hospital NHS Trust

The NHS Newham and Astra Zeneca joint project on improving chronic obstructive pulmonary disease (COPD) services within the local healthcare community (LHC) comprised Primary Care, Secondary Care, Community Health Care (provider arm of the PCT), Public Health and Commissioning.

The background to their service

Oxygen is prescribed by primary and secondary care clinicians. Prescribing of oxygen by secondary care (the chest clinic) is based on structured assessment and a database is kept of the patients that are under their care.

Primary care prescribing may also be based on an effective assessment but there is no evidence to verify this.

There were no formal management arrangements of the oxygen service in NHS Newham. Ongoing review of oxygen patients were not being preformed for any patients. There was no standard database kept of patients on oxygen and the information was not being shared between the patients being managed in primary care and by the chest clinic.

Oxygen invoices were managed by the medicine management team and there was no reconciliation between the database and monthly invoices provided by the service provider. Also, there was lack of evidence whether any actions were taken to act on the reports produced or provided by the oxygen supplier e.g. compliance reports, out of area reports etc.

The pathway of care

Newham had localised the COPD pathway using the ‘Map of Medicine’ but it did not incorporate any details regarding the prescribing or the ongoing management. There were gaps in the service being provided and these would be identified during the development of the oxygen pathway.

The first page of the draft home oxygen therapy pathway is shown below.

The project aims and objectives

The aim of the work was to improve the prescribing and ongoing management of patient on home oxygen therapy.
Specific objectives:
- To produce/manage the oxygen data base and check on a monthly basis for accuracy by April 2010
- To develop and implement an assessment and review process for patients on oxygen therapy by December 2010
- To reassess and review 25% of patients on oxygen and record any changes to their oxygen therapy by April 2011
- To reduce wastage in oxygen prescribing and secure a 20% reduction in cost September 2010 compared to the 2009/10 cost
- To update and expand the localised pathway (to include development of a new Home Oxygen Service pathway) and promote its implementation across the local healthcare community by April 2011
- To incorporate the COPD strategy objectives into the redesign as appropriate

The process of improvement they undertook and overall approach to address the issues.

A steering group was setup including primary and secondary care clinical leads to address the issues and take forward the outcomes of the stakeholder event which incorporated patient representatives.

Issues and challenges they faced with potential solutions
The main challenge to potential solutions has been negotiating change in the current way of working with the secondary care managers. The clinicians have been willing to redesign the service. The other challenge has been the current reorganisation of the PCTs. As a consequence there is a risk that no project support will be available from April 2011. This has been reported to the chief executive.

Implementation of the reviews has presented capacity issues but these have been resolved by temporarily increasing the capacity to clear the backlog.

The testing they did and key learning to date, including the overall benefits
The plan to review of patients on oxygen has commenced and it is anticipated that at least half of the patients (approx 80) managed by the chest clinic will be reviewed by the end of March 2011. The data will be collected and analysed on a monthly basis and the work will be amended accordingly.

Similar process will be followed for monitoring of blood gases for patients who attend as day cases. Outcomes of this initial phase will be used to plan the work for patients not being managed by the chest clinic. It is anticipated that all oxygen prescribing will be under the specialist respiratory service but this is dependent upon pathway changes being agreed.

Commissioning considerations
Extensive discussions have occurred in order to try to achieve change. If these changes are not achieved or result in protracted meetings and discussions then notice to terminate the contract will be given. This has already been considered and the final decision will rest with the GP Commissioning Board.

Workforce considerations
The review of the chest clinic oxygen patients is being supported by two suitably trained and clinically supervised second year medical students which poses risk to the ongoing sustainability of the work. Agreement has been reached to add capacity in the form of Community Matrons to review primary care oxygen patients. Once all the patients have been reviewed it should be possible to maintain the ongoing reviews within the current workforce.

Potential/actual QIPP and cost savings/avoidance – defined as quality, innovation, productivity and prevention
The oxygen database has been produced and is updated on a monthly basis. In addition, the information is shared with the acute so that the information is consistent.

Productivity savings of £12,057 have been secured from April to November 2010 purely from accurate data management. This included removal of deceased patients, removal of duplicated patients and removal of out of area patients.

An assessment and reviews form has been developed to use across the local healthcare community. In addition, local oxygen protocols have been agreed and incorporated into the review form. This should result in improved quality of management of patients on oxygen and is projected to provide productivity savings of approximately of £80k.
Improvement stories

Review of the patients being managed by the chest clinic has commenced and outcome data is being collected. It is anticipated that the target of reviewing 25% of patients by April 2011 will be achieved.

The purchase of three Point of Care Arterial Blood Gas (ABG) meters will facilitate with the oxygen reviews and will eliminate day case attendances for ABG monitoring. This innovative approach should result in net productivity savings of approximately £250k for a full year whilst improving the quality of the service for patients.

Discussions are also being held to manage the oxygen on a sector wide basis to further secure productivity gains.

**Data collection, a summary of what it showed and overall evidence including any charts**

Baseline data has been collected and as the oxygen review data becomes available it will be analysed to establish quality and productivity improvements. Initial data indicates that the cost of home oxygen service is not increasing.

**Emerging workstream principles, including ‘top tips’**

Top tips for the management of the oxygen service are:

- Engage with IT to produce a database which allows a quick method of updating with the oxygen provider invoice
- Share a common database with other services (chest clinic, community matrons) to allow immediate database management
- Incorporate compliance reports into the database and organise reviews as appropriate
- Production and use of standard reports:
  - Confirm out of PCT catchment area patients are registered within the PCT
  - Open Exeter reports – deducted patients, duplicated patients, identical provision at the same address
- Consider purchase and use of ABG Point of Care meters to facilitate oxygen prescribing, reviews and optimising therapy including discontinuation as appropriate

Any generic learning (LTC) that we extrapolate from the work e.g. how this could be applied to other areas:

- Ensure engagement of the clinical leads at the outset and get them to lead the process
- Agree metrics and ensure ease of availability at the outset
- Ensure robust data collection plan and implement as soon as possible - sufficient time needs to be allowed for the data team to incorporate this into their workload
- Engage commissioning to ensure that you are aware of the current contract and who is monitoring it

Project lead contact details for further information

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The feasibility and impact of withdrawal of Short Burst Oxygen Therapy (SBOT)

Royal Free Hospital NHS Trust, NHS Waltham Forest & North East London, North Central London and Essex Health Innovation Education Cluster (NECLES HIEC)

Background to the service
There is considerable data available and published, that the use of short burst oxygen therapy (SBOT) or intermittent oxygen at home for the relief of breathlessness, in patients without chronic hypoxemia is not effective and costly to the NHS.

This pilot was undertaken to address the issue of the prescription of SBOT for patients with chronic obstructive pulmonary disease (COPD). Although current guidance relating to long term oxygen prescription does not support provision of SBOT, there is considerable evidence from the home oxygen service data and surveys that that SBOT is still provided in this way and wastes resources.

Furthermore, there are other more effective ways that can be utilised to treat breathlessness and thus use of SBOT leads to sup-optimal care. It is estimated that up to 25% of the home oxygen provided in England and Wales is in the form of SBOT. However, there is no data available on withdrawal of SBOT in patients without hypoxaemia and also no information regarding how successful withdrawal is, in this patient group, both in the short term and longer term e.g. six months. Patients may become dependent on SBOT and thus considerable education will be required, both for the patient and the healthcare professional, about other interventions for breathlessness. Such data on withdrawal will also inform health economic evaluations and aid future guidance on home oxygen services.

The original intention was that the project would take place in two sites - one site in North London: Royal Free Hospital NHS Trust (Christine Mikelsons (CM) & Professor Wisia Wedzicha (JAW)) and NHS Camden, and the other site in North East London: Whipps Cross University Hospital NHS Trust (Professor Mike Roberts - HIEC facilitator for the theme) and NHS Waltham Forest (Anne Crawford (AC)). Other members of the team included Robyn Hudson (RH), Charles Bruce (CB), Gavin Donaldson (GD).

The gold standard pathway vs. local pathway
The gold standard pathway is that long term oxygen therapy is assessed by arterial blood gases, resulting in a prescription of oxygen for 15 hours over a 24 hour period. However, for short burst oxygen therapy (intermittent oxygen) no such assessment has been formalised and short burst oxygen is usually prescribed for breathless patients without oximetry. Appendix 1 illustrates the pathway for the NHS Waltham Forest oxygen assessment service.

The project aims and objectives
The aim of this project was to review all COPD SBOT prescriptions, of more than three months, in the Camden and Waltham Forest PCT areas, in order to reduce SBOT prescription by 75% over the course of one year (July 2010 to July 2011). This figure was aimed high as we are aware that most SBOT patients (once palliative prescriptions have been excluded) have no clinical indication for SBOT.

Patients in the palliative care category were excluded for the purpose of this analysis. The intention was to obtain data from the PCTs and contractor, regarding current prescription of SBOT in each of the study areas.

Patients with a prescription of SBOT were offered an appointment with a respiratory specialist to discuss their use of oxygen and where indicated, full assessment of their requirement for long term oxygen was performed. In cases where no clinical need was identified, patients were counselled and advised that they did not need to continue with oxygen at home.

Discussion then took place with the patient about alternative interventions for the management of breathlessness. Patients were offered supported withdrawal of the oxygen supply and followed up with an appointment at an interval of one month. Arrangements were made to withdraw the oxygen supply with the contractor.

If SBOT patients were unwilling to have the oxygen withdrawn, then they were offered an appointment with the respiratory consultant for further discussions and assessment. Further assessment of patients unwilling to be withdrawn from SBOT were offered. All patients will be followed at six months to assess outcomes such as quality of life, arterial blood gases, primary care visits and any hospital admissions.

The process of improvement undertaken and overall approach to address the issues
Meetings and telephone review to support this work:

- In the early stages of the project, two meetings took place (14 June and 30 July 2010) with NHS Improvement Lead, Ore Okosi and various members of the team (JAW, CB, CM, GD, AC, RH) to discuss and plan the project
- AC, CM, RH attended the NHS Improvement - Lung launch on 16 July 2010 and AC & CM attended the NHS Improvement System training day on 28 July and 19 August respectively
- AC attended the oxygen peer support meeting at Edgware Community Hospital on 23 September. CM attended the oxygen peer support meeting at Milton Keynes in November
- AC, CM had a telephone review 13 August and two half day meetings on 28 October 2010 and 27 January 2011
- In addition, there have been regular telephone updates between AC and CM (13/8/2010, 27/8/10, 3/9/10, 15/10/10)
Data collection was started at Waltham Forest on 15 October 2010, following the development of:

- A flyer inviting participation (see appendices)
- A letter of agreement of patients to take part (see appendices)
- An updated patient assessment proforma (see appendices)
- A patient follow-up proforma (see appendices)
- An agreement with local GPs to support actions within the project
- Written details informing GPs of patient’s involvement in this NHS Improvement - Lung project

Issues and challenges faced with potential solutions

- Issues of maintaining up to date HOOF data and an oxygen database in Waltham Forest PCT as administration support ceased at the end of August 2010. Discussions with the medicines management lead was required in order to determine continuation and agreement of support to the oxygen service
- Access to data proved to be a challenge which resulted in the following email trail:
  - Commissioners at Camden PCT three times (CM)
  - Home oxygen service at Department of Health (CM)
  - Clinical lead for respiratory medicine NHS London (CM)
  - Oxygen lead for NHS London (CM)
  - Strategy team NHS London
  - Commissioners at Camden PCT (JAW)

The testing was performed and the key learning to date, including the overall benefits

Patients in NHS Waltham Forest on short burst oxygen (CC2a and CC2b) have been reviewed and assessed. The data has been collected and analysed. Metrics and measures included numbers receiving SBOT, three months retrospective data to understand demand and capacity, actual hours SBOT use, FEV1, SaO2 and ABGs, SGRQ, HAD and BORG scores, number of reviews, number of admissions related to respiratory condition, number of patients with maintained withdrawal at six months and improvement stories to include patient’s experiences.

Potential/actual QIPP and cost savings /avoidance – defined as quality, innovation, productivity and prevention

There are potential cost savings from withdrawal of SBOT and in addition further cost savings could be identified as a result of performing ABG sampling in the community thus obviating the need for patients to attend hospital for this reason.

Data collection summary

October to December 2010 results:

A total of 25 patients on SBOT in the borough of Waltham Forest with a primary diagnosis of COPD were identified. Appointments were sent and patients, who agreed to participate in the project, visited in their homes:

- Two patients have had their SBOT successfully withdrawn
- Nine patients (47.3%) were exacerbating at the time of assessment
- Two patients were withdrawn from the study: one unwilling to comply with interventions, one recently bereaved and worsening of short term memory loss
- One patient was dying and refusing hospital admission and one refused assessment
- One withdrawn from SBOT as required long term oxygen therapy
- One was in hospital having been admitted with pneumonia
- The remainder are awaiting assessment

The results of 19 patients are presented below for HAD, SGRQ, FEV1 (morbidity) and oxygen SaO2 at assessment on first visit.
Since December 2010, a further four patients have been assessed:

- One patient was depressed and declined to participate
- One patient was depressed with short term memory loss and withdrew from the study
- One patient refused to have SBOT and was removed from the study
- One patient agreed to removal of SBOT which was replaced with ambulatory oxygen
- One patient assessed earlier subsequently withdrew from study
- One patient has not been seen due to frequent hospital admissions

**Summary**

Out of a small sample of 25 patients, three patients have been removed from SBOT.

There were a variety of reasons for non-removal of SBOT including:

- Current exacerbations (not recovering)
- Frequent exacerbations
- Dying
- Depression and memory loss
- Eligible for LTOT but declined this therefore SBOT left in
- Patient intermittently desaturated, therefore needed SBOT
Emerging workstream principles, including ‘top tips’

The issues relating to withdrawal of SBOT are complex and multifactorial: these tend not to relate to sub-optimal management, but rather, to the fact that this subgroup of patients have severe COPD, are unwell, are maintained at home and are too sick to consider removal of oxygen. The majority of patients in this study had SBOT prescribed for over 12 months (often following an exacerbation) which had also led to some psychological dependence over time.

However, it is worthy of note that the time frame for this study has spanned an excessively cold period resulting in high incidents of acute exacerbations where patients genuinely needed their SBOT which was justified.

The following points have become clear during the study:

• Communication issues around discharge of complex patients who have oxygen requirements at home: e.g. incorrect oxygen prescription on discharge which has lead to readmissions
• Patients discharged with no information and no support regarding their oxygen therapy
• Patients who are commenced on SBOT for exacerbation need to be reviewed six weeks for assessment, education and support with a view to removal of oxygen (as it is clear that long term SBOT encourages psychological dependence)
• Whilst there is an assumption that patients on SBOT have been given it erroneously, this study has demonstrated that in the majority of these cases this has not been the case
• There needs to be clarity about the correct prescription of LTOT, given the complexity of removal of SBOT

Any generic learning (LTC) that can be extrapolated from this work i.e. how this could be applied to other areas

• The need to ensure that communication between the community and hospital on discharge is improved for seamless care
• Patients who are prescribed SBOT may not have been seen by a clinician specialist in oxygen therapy and may not have been told how long the prescribed oxygen should be used. Often this results in an instruction from the engineer in the use of the oxygen according to what is recorded on the HOOF (e.g. for two hours, or morning and evening regardless of breathlessness). Hence it may not be the case that the patient has had an instruction to use it for 5-10 minute bursts to relieve breathlessness (which is a commonly held assumption by clinicians). Further information in the HOOF comments box needs to explain how the prescribed oxygen should be administered

Future work

The plan for the next six months includes the following:

• Continue to look at new starters on SBOT six weeks post exacerbation with a view to reassessment
• Document the SBOT patient journey via a process map to indicate the referral routes and possible gaps in the care pathway
• Develop a questionnaire relating to access to oxygen data and circulate it to other members of the NHS Improvement - Lung - ‘Improving Oxygen Services’ group so that an understanding of the difficulties regarding access can be gained

Project leads contact details for further information

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Improveing home oxygen services
West Hertfordshire COPD Service

The background to their service
The West Hertfordshire community chronic obstructive pulmonary disease (COPD) service is a service commissioned by NHS Hertfordshire and provided by Barnet Community Services. The service is integrated across care settings and organisational boundaries and provides patients with home oxygen assessment and review, hospital-at-home, respiratory consultated clinics and pulmonary rehabilitation.

Upon the commencement of the service the West Hertfordshire team very promptly began assessing new patients for oxygen therapy and reviewing patients already in receipt of oxygen, documenting changes to the home oxygen order forms (HOOFs) and monitoring the associated changes in oxygen prescribing spend.

NHS Hertfordshire supply the service with detailed reports around activity and cost which are free of ‘ghost patients’ (e.g. patients listed as in receipt of oxygen but are actually deceased) and clinicians have access to a weekly list of new oxygen orders and the identity of the clinician initiating the prescription.

As at July 2010 the new service had reviewed 40% of the 800 patients in receipt of oxygen therapy and undertaken therapy modifications and where clinically appropriate therapy withdrawal in a number of the reviewed patients.

Having achieved these quick wins the service sought acceptance from NHS Improvement - Lung in order to facilitate a shift in focus from cost savings to cost avoidance.

The project aims and objectives
Aims:
To reduce the amount of inappropriate home oxygen prescribing and reduce the cost of home oxygen within West Hertfordshire.

Objectives:
- Identify where and who is inappropriately prescribing home oxygen to patients with normal oxygen levels
- Review all patients commenced on home oxygen within four weeks of commencing and alter oxygen prescription to match patient needs in most cost effective way
- Target education at groups of clinicians who are prescribing home oxygen inappropriately
- Develop an educational package and competency assessment tool
- Produce proposal for the introduction of a register of home oxygen prescribers who have undergone training and competency assessment with the aim of improving the quality of prescribing

The process of improvement they undertook and overall approach to address the issues
A project team was established and project monitoring integrated within existing key performance indicator reporting to the Trust Director of Operations and PCT Commissioners.

The clinical team continued to review on a weekly basis all sources of new oxygen prescribing and collaborated with the PCT home oxygen services lead in reviewing monthly prescribing reports and quarterly supplier concordance data, ensuring clinical oversight around the modalities of oxygen received by patients.

Inappropriate prescribers were identified within both primary and secondary care and so the first phase of work centred on providing education sessions within target GP surgeries.

The second phase of work currently in development is educational sessions targeted within the local Acute Hospital and the teams have secured a place on the teaching rota for new doctors and educational sessions booked with higher grade healthcare professionals - specialist registrars, foundation year one and foundation year two.

The feedback and experienced gained from this work will inform the development of an oxygen prescribing educational pack and competency assessment.
**The West Hertfordshire Care Pathway**

**SpO₂ <92% on air or breathless on exertion thought to be due to oxygen desaturation**

Refer patient for home oxygen assessment in COPD clinic or at home
- Arterial blood gases
- 6 minute walking test

**Patient requires oxygen**

HOOF completed and faxed to BOC and PCT medicines management administrator

Acute Hospital and GP prescribing, weekly list to community team

If patient breathless consider referral to pulmonary rehab or breathlessness clinic or community consultant clinic

**Patient does not require oxygen**

If patient breathless consider referral to pulmonary rehab or breathlessness clinic or community consultant clinic

**Patient registered on clinical home oxygen database (HoXAM) and COPD database**

Community respiratory nurse follows patient up at 6 and 12 months in first year then 6 monthly

**Reassess O₂ requirements and alter HOOF if indicated**

Patient education and advice on safety and coping with O₂

Monitor patient and feedback to GP

Provide patient with contact number for clinical support

Adult home oxygen service

Monitors patient and provide feedback to GP

COPD review and develop self-management plan

**Issues and challenges they faced with potential solutions**

**Data collection:** Current service key performance indicators (KPIs) are in a different format to the requirements of NHS Improvement - Lung and therefore it has been a challenge to find time to transform the data from one format to another.

**Solution:** A local measures matrix was discussed and agreed with the oxygen projects national improvement lead (NHS Improvement - Lung) and so appropriate data has been collected to demonstrate progress in respect of the specific project aims and objectives.

Secretarial support and a budget has been agreed and secured from the project team’s own organisation so data can be put into a format suitable for project reporting.

**Potential/actual QIPP and cost savings/avoidance – defined as quality, innovation, productivity and prevention**

Cost savings have been achieved from when the project commenced, with the monthly spend on oxygen prescribing showing a consistent decline. The October 2010 spend represented a 12% reduction on the monthly spend in April 2010.
This has been accompanied by a reducing trend in the actual numbers of patients on home oxygen.

Key learning

**Model of care:** An integrated model of care prevents duplication and is a cost effective solution to managing the home oxygen service. The assessment and follow-up of patients on home oxygen can be undertaken by a nurse led service provided there is integration with respiratory physicians so that prompt review when indicated can take place.

**Workforce competences:** The analysis of the sources of oxygen prescribing and subsequent educational sessions have revealed that home oxygen is often prescribed by junior medical staff who have insufficient knowledge of best practice guidelines.

**Data coordination:** The data provided by the suppliers is not deemed user-friendly and there also appears to be a reluctance on the part of the oxygen supplier to directly provide service clinicians with the data even when the PCT agree that this is appropriate.

The project team feel that a home oxygen database (such as the proprietary HOxAM system) is necessary for service professionals to efficiently monitor the large numbers of oxygen patients who require follow-up.

**Project lead contact details for further information**

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Home oxygen service improvement project

NHS Sheffield

The background to their service
NHS Sheffield as part of their Achieving Balance Health Strategy (2010) identified that they had the highest projected forecast spend on home oxygen therapy within the region.

There was no local requirement for patients to have an oxygen assessment in advance of therapy being ordered/prescribed and patient's ongoing need for oxygen therapy was not always reviewed.

The project aims and objectives
Aim: By July 2012, all NHS Sheffield chronic obstructive pulmonary disease (COPD) patients newly prescribed home oxygen have had an initial quality assured assessment and all COPD patients with home oxygen are systematically reviewed in line with British Thoracic Society/NICE guidelines resulting in the correct therapy (home oxygen order forms (HOOFs) and equipment) leading to improvement in patient quality of life, increased activities of daily living as well as increased life expectancy, reduced unscheduled admissions and robust oxygen cost control.

The process of improvement they undertook and overall approach to address the issues
A project team was established (comprising clinicians, medicine management technician and managers from both primary and secondary care) and the NHS Improvement - Lung work integrated within Sheffield's Achieving Balanced Health Strategy initiative.

The project manager, medicine management technician, and specialist nurses were assigned to the project and together undertook a detailed analysis of the home oxygen register and HOOFs.

The team carefully studied the concordance report data and monthly invoices to understand the scope and scale of the issues. They were then able to break this down to GP in order to analyse ordering or prescribing at a local level.

This enabled oxygen under/over usage to be identified together with non-use and anomalies in the oxygen modalities assigned to individual patients.

An initial process mapping workshop was undertaken to understand the sources of oxygen prescribing, the basic patient journey and service gaps.

Initial scoping work identified areas of potential efficiency improvement within home oxygen provision:

• Oxygen being supplied when not required
• Patients not receiving a formal assessment and or not undergoing regular review or risk assessment
• Changes in clinical need not being communicated to the supplier
• Holiday home oxygen order form (HOOF) not being cancelled
• Inefficient time of removal follow death
• No locally commissioned services
• No designated home oxygen therapy manager
• No robust systems, process or pathway, including fire risk assessment

Some initial demand modelling has been undertaken and this has been coupled with some analysis of the costs of different parts of the pathway.

This work together with information from the Department of Health Good Practice Guide has been used to inform a business case and draft a new service specification.
**Issues and challenges they faced with potential solutions**

Initially the project experienced some challenges gaining access to some of the data needed to record baseline measures.

Protracted telephone and email contact with the oxygen supplier was required in order to assure the supplier that project team members (who were not the originally designated PCT home oxygen service lead) were legitimately entitled to access.

Persistent and on-going liaison with the oxygen supplier has resulted in better data access.

**Commissioning considerations (where appropriate)**

The multidisciplinary project team have worked together and along side the Department of Health Good Practice Guide, *Home Oxygen Services – Assessment and Review* (HOS-AR) have developed a successful business case to go forward to commission a HOS-AR in Sheffield.

This will be a long term conditions HOS-AR and will integrate with other care pathways such as cardiology, palliative care, neurology. It will link with and complement part of a COPD Quality, Innovation, Productivity and Prevention (QIPP) redesign which is currently targeted at those patients with mild and moderate disease.

The oxygen service business case outlined the de-commissioning and re-commissioning of a new integrated evidence based quality led HOS-AR service that promotes efficiencies and effectiveness and will serve the other end of the continuum for adult patients with severe and very serve COPD across the primary secondary care interface.

This approach is known to have a marked impact on quality adjusted life years and life expectancy.

The proposal will enable a greater proportion of assessments to be carried out in the community. This will avoid potentially high cost associated with respiratory outpatient tariffs.

**Draft outline of new model**

**Level 1 (Community):**
- Pulse oximetry at a GP practice level for the timely identification of hypoxia
- District nurses – ongoing assessment for at risk groups

**Level 2 (Community):**
- Short bust oxygen therapy (SBOT) for the assessment and removal of SBOT
- Ambulatory (AB) for assessment, provision and ongoing monitoring
- Assessment for long term oxygen therapy

**Level 3 (Secondary care team input with community based follow-up):**
- LTOT assessment of complex patients

The team are setting in place internal measures to help mitigate risk (for example financial and oxygen patient register management systems) and have devolved responsibility, for register management and referral for fire risk assessment to the practice based consortium and local GP practices.

**Workforce considerations**

Staff shortages in the wider team (2WTE) are making resources limited.

**Potential/actual QIPP and cost savings/avoidance – defined as quality, innovation, productivity and prevention**

Through improved data management and data cleansing a number of patients were identified who upon consultation were able to have therapy modified and in addition oxygen devices were removed from patients’ homes where it was established they were no longer needed.

This has resulted in a saving of £10k per month, with a forecast saving of £120k per year and subsequent years.

**Key learning**

Cross functional working has enabled the project to move more quickly and take the pressure off core team members because others are working on behalf of the project.

An example of this is the additional help sought from the internal audit team in order to undertake an in-depth analysis to help support our initial findings. This is supported by our finance and performance directorate.

Early on in reviewing the data, anomalies were seen which needed to be understood and assessed in relation to see if they were system, process errors or adverse occurrences.

By approaching the fraud team the style of data required has been specifically requested so that it is easy to read and meaningful to the end user.

This has enabled the team to help shape change and to very quickly gain organisational support, setting the bar high for the vision of improved oxygen services.

This is motivational to the core project team as improvements that have been set in place have now been realised.

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**This approach is known to have a marked impact on quality adjusted life years and life expectancy.**

**The proposal will enable a greater proportion of assessments to be carried out in the community.**
Home oxygen service improvement project

NHS Hull and the City Health Care Partnership

The background to their service
Historically, NHS Hull did not have a structured or funded oxygen assessment and follow up service, with patients’ predominantly prescribed long-term, ambulatory and short burst oxygen on discharge from hospital without formal assessments and structured follow up review.

In addition, GPs issued oxygen therapy to patients on a ‘want’ rather than need basis usually for breathlessness without any form of assessment.

From April 2010, following a tendering procurement process, NHS Hull commissioned a new home oxygen assessment and follow up service. This is a new service for the city; the provider successful in the procurement process was City Health Care Partnership.

Hull had approximately 800 patients in receipt of oxygen therapy at the beginning of April 2010. The new service had a total of 260 patients referred into the service within the first three months of being operational.

The project aims and objectives
To contribute to a reduction in unscheduled hospital admissions and optimise chronic obstructive pulmonary disease (COPD) patient care through the delivery of appropriate and cost-effective oxygen therapy to COPD patients identified as being in clinical need determined through assessment by trained healthcare professionals.

Specific objectives:
- Remove inappropriate oxygen provision, ensuring correct equipment and therapy is delivered to new and existing patients on oxygen
- Reduce unnecessary costs of oxygen and equipment
- Risk assess patients/carers prior to and during their use of oxygen therapy
- Work with the local fire brigade to produce and develop a workable local policy on smoking and oxygen provision
- Educate patients on health and safety issues surrounding smoking and oxygen therapy
- Develop a written (signed) contract between patient and health care professional (HCP) with clauses to remove provision on grounds of health and safety or no clinical need/benefit

The process of improvement they undertook and overall approach to address the issues
Following acceptance from NHS Improvement - Lung in June 2010, a multidisciplinary project team was formed with experienced respiratory nurses, smoking cessation specialists, commissioners, oxygen providers, a patient, and the fire brigade.

The project team work was integrated within wider COPD pathway service development work being undertaken by the PCT.

Data metrics were agreed by the project team and data collection processes established and information provision responsibilities assigned.

Invoices from the oxygen supplier (Air Products) are received by NHS Hull home oxygen services lead within the commissioning department and the home oxygen service (HOS) also has access to these and the concordance reports. The Service checks against the Open Exeter home oxygen order form (HOOF) database and reviewed by the specialist nurses who also review flow and provisions rates.

The administration team within the service also data cleanse the invoices and report back to the oxygen provider with errors and updates as necessary.
Patients on ambulatory oxygen are recalled for an ambulatory assessment and the project has made cost savings through this recall mechanism. The team analysed the long term oxygen therapy (LTOT) patient data provided by the supplier giving particular regard to:

- Multiple therapy combinations
- Duplicate charging
- Deceased patients
- Out-of-area patient charges
- Under/over usage

Since July 2010, a total of 428 patients have been assessed or reviewed by the service with new therapy being initiated and appropriate changes to existing therapy made in terms of duration and/or flow rate alterations, device changes and in some instances therapy withdrawal (when deemed of no clinical benefit).

The team takes a proactive approach to managing the ongoing safety risks to patients in receipt of oxygen (or who pose a risk to others) due to potential fire hazards.

A local risk assessment pro-forma is completed by the clinical team at every review and which has strong links with both the local oxygen provider and the Fire Brigade, enabling issues and concerns to be highlighted and addressed. Mechanisms for involving patients (and carers) in their risk assessment have been developed and the dangers of smoking with oxygen are discussed.

The team aim to undertake 40 risk assessments per month and the multi-stakeholder team have drafted a local policy on smoking and removal of oxygen provision.
**Issues and challenges they faced with potential solutions**

**Stakeholder agreement**: bringing wider stakeholders on board in respect of the ‘Smoking and Removal Policy’ has proved challenging and resulted in delayed policy development and continued risk of possible incidents with patients.

The team is attempting to address this by bringing all stakeholders together and providing evidence around health and safety, information on incidents occurred and monitoring the clinical impact of therapy removal.

**Healthcare professional compliance**: Not all local healthcare professionals are currently delivering care in line with future local policy, resulting in inconsistent messages to patients, safety risks and incidents.

The team are addressing through education sessions developed (for all healthcare professions groups) around the new policy and how it should be implemented into their working practice.

**Patient refusal/anxiety regarding removal of therapy**: Strategies being adopted to address this include educating patients via information leaflets, DVD, verbally about the dangers and referring smokers to smoking cessation services.

**Project team capacity**: Pressures from existing work are being offset through ongoing development of a Project Delivery Plan with specified activities, timescales and team member responsibilities.

**Commissioning considerations**
The service forms part of a community contract with a service specification and performance indicators in place.

The performance and delivery of the service is monitored via these indicators on a monthly basis. The commissioner and provider meet regularly to go through this data and discuss service delivery. The service was initially commissioned for two years, based on the data and patient outcomes reported the commissioning organisation will look to extend this contract. Due to the changes in the way services will be commissioned in the future, the GP Consortia will need to be involved in this process and future developments.

**Workforce considerations**
Discussions have taken place with the provider in terms of how they expand their respiratory workforce. They currently employ two specialist respiratory nurses and two oxygen nurses, as the service expands they will be considering the options of having respiratory expertise across their long term conditions service and training other staff in terms of respiratory.

**Potential/actual QIPP and cost savings/avoidance – defined as quality, innovation, productivity and prevention**

Since July 2010, 428 patients have been assessed or reviewed, prior to assessment these patients had a combination of 601 oxygen therapies in place.

After the assessments the combination of therapies was reduced to 433 and there were 145 removals and 44 decreases in oxygen flow rate. This has reduced the monthly invoice by £11,378.

In addition, 24 patients on oxygen have stopped smoking, due to COPD smoking cessation specialists, and the home oxygen service now have 404 patients on their caseload and in the cycle of review.

The total number of oxygen users in Hull is 763, at this current time, which includes palliation patients who are not in the current service caseload, over half coming in to the service already.

**Key learning**
Data can be utilised effectively to provide required analysis; at first it seems impossible but with specialised performance analysts on board this can be done.

Launching a new service in parallel with undertaking a process improvement project is very challenging - in hindsight it may have been better to allow the service to develop then seek improvements. However, the opportunity to take part in a national programme was a big incentive.

Collaboration with NHS Improvement - Lung has provided:
- Greater clarity, structure and focus via project planning
- Motivational interaction with peers
- Support for reviewing areas of weakness and development of
- The expansion of the future work plan to include demand and capacity analysis and the development of a prescribing costs ‘dashboard’

N.B. Please note that in respect of data and finance this report is as at 15 December 2010.

**Project lead contact details for further information**

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NHS Gloucestershire home oxygen assessment service implementation

NHS Gloucestershire

The background to their service
The existing respiratory service provider function is spread over a very large geography with a varying and diverse socio-demographic. There is no formally commissioned community-based oxygen assessment service; the only assessments available being for a limited number of specialist conditions and children all within the acute hospital setting.

Prior to the commencement of the project there were approximately 1,000 patients on oxygen therapy who required review and 150 new patients per year being referred for initial hospital (clinic-based) oxygen assessment.

There are currently around 860 patients receiving home oxygen in Gloucestershire, however the oxygen supplier data indicates that there are more than a quarter of these patients who are using none or very little of their prescribed oxygen.

The project aims and objectives
To commission a high quality home oxygen assessment service for patients in Gloucestershire

Specific objectives
- Produce a service specification which details the expectations of the commissioners with robust quality outcome and activity performance indicators
- Implement a service which enables all new and existing patients on Home Oxygen Therapy to be appropriately assessed, reviewed and monitored
- Undertake a rationalisation of current prescriptions for oxygen in order to reduce unnecessary spend on oxygen within the county

The process of improvement they undertook and overall approach to address the issues
The project lead undertook a review of service specifications for established Home Oxygen Assessment and Review teams by visiting a number of project team sites. In addition, intelligence gathering on service costs, workforce arrangements and infra-structure was undertaken from a number of sources including the Department of Health Good Practice Guide.

Work was undertaken to better understand the current patient profile and prescribing costs; this was achieved by a detailed analysis of the concordance reports and monthly invoice data.

A process of obtaining ‘sign-off’ of a previous (2009) business case was undertaken with new (additional) costs identified through the project work integrated within the proposal.

A service specification was drafted and then reviewed by the respiratory steering group. This was presented then to the Quality, Innovation, Productivity and Prevention (QIPP) management board, a forum set up to assess, evaluate and scrutinise all service development proposals that required pump-priming and/or recurrent funding.

In parallel to this work the PCT procurement team began the initial work on proceeding with a tender process as it was envisaged that the new service would be open to any willing provider.

Issues and challenges they faced with potential solutions
Participation with NHS Improvement - Lung has provided the opportunity to discuss our locally proposed service plans with more established teams. Through the course of these discussions, it has become evident that the original sum identified and budgeted to fund the cost of the development does not in fact cover the true costs of the service as specified and therefore does not support the business case and progression to open tender.

The findings have been presented to members of the NHS Gloucestershire Executive and it has been decided that small short-life working group will be established to focus on the top 10% of patients identified on the concordance report as not using their prescribed oxygen.

The work of this group will utilise a plan-do-study-act cycle in order to monitor the reduction in oxygen usage with this sample of patients.

The evidence collected will then be used to amend the original business case to reflect the success of the pilot project. The ongoing challenges to this project continue to be financial and the present changing organisational situation.
Commissioning considerations

• The application of service improvement tools such as multi-stakeholder process mapping must proceed carefully in a health economy which may be considering putting out future services to tender.

• It is important that in seeking to understand the existing oxygen patient journey (and uncover existing ‘hidden’ oxygen services) the process of identifying areas of improvement does not in any way compromise a future tender process.

• The tendering process also takes a considerable amount of time e.g. a minimum of five months and therefore it is unlikely that potential benefits from the service are not realised before the end of the project term.

Potential/actual QIPP and cost savings / avoidance – defined as quality, innovation, productivity and prevention

Following data analysis from both the PCT information team and the senior analyst from NHS Improvement - Lung, we were able to demonstrate the potential savings to the PCT would be in the region of £250K. However, we do need to confirm that these savings are material and could be achieved and delivered.

Although we have fairly robust numerical data from the concordance reports it will be a challenge to identify the patients from this data and there will be a reliance on paper records and GP surgery information to identify individuals.

However, once identified it is anticipated that this cohort will be already be known to the respiratory team both in primary and secondary care.

Key learning

Although it may appear that NHS Gloucestershire has not made rapid progress during the first six months of this project, we do however have a much clearer understanding of the data that we have and also the financial implications of oxygen usage within the community. We also have a clear understanding of the potential impact to patients and services if we continue to do nothing to improve the service.

Project lead contact details for further information

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Sustaining the efficiency and effectiveness of the Milton Keynes Home Oxygen Service - Assessment and Review (HOS-AR)

Milton Keynes PCT Community Services and Milton Keynes Hospital

The background to their service

A PCT sponsored pilot project conducted in 2008, highlighted health inequalities and variation in usage of oxygen for patients on home oxygen.

Patient experience varied depending on who prescribed their oxygen, with a two-tier oxygen service in existence and little integration of primary and secondary care across the oxygen pathway.

These clinical issues combined with serious financial control issues which meant that the PCT had highest cost per patient within the SHA.

In January 2009, a chronic obstructive pulmonary disease (COPD) co-ordinator and an administrator were appointed (through using a ‘spend-to-save’ initiative) to support the redesign of the home oxygen therapy pathway through service mapping and process audit.

Protocols were jointly developed with clinical teams and the implementation monitored by the COPD administrator.

The resulting service significantly transformed the care of patients on home oxygen within Milton Keynes, with newly initiated respiratory oxygen patients first subject to a formal assessment and within dramatically improved financial control. Palliative care, cluster headache and paediatric patients were not included in this protocol but were supported and monitored by the home oxygen service team.

In order to sustain and enhance the benefits of this improved service, and to address outstanding areas for improvement (most notably patient recall mechanisms for long term oxygen therapy (LTOT) review and ambulatory oxygen assessment), the multidisciplinary team applied to take part with NHS Improvement - Lung and were accepted on to the programme in the summer of 2010.

The project aims and objectives

- Enhancement of existing care pathway by the production of a (service) adoption ladder
- Improve ambulatory oxygen assessment by carrying out a pre and post of clinic set up evaluation for the ambulatory oxygen assessment clinic
- Development of quality patient questionnaire pre and post use of patient information leaflet to see if patient experience improves

The process of improvement they undertook and overall approach to address the issues

Objective 1:

Enhancement of existing care pathway for the HOS-AR service.

An initial process mapping exercise was carried out by the project lead by talking to key personnel in the service (consultant, admin, respiratory team) in order to understand the following.

- New appointments lead time (approximately three weeks at January 2011)
- The reasons why patients were not being recalled for review (initial findings indicate a demand and capacity mismatch combined with a problem on hospital discharge a patient appointment requested but no follow up appointment made)
# PCT protocol for primary and secondary care patients

## Protocol for Assessment and Prescription of Oxygen Therapy

<table>
<thead>
<tr>
<th>PT. IN</th>
<th>COMMUNITY OR VISITING G.P. SURGERY</th>
<th>PT. ATTENDING OUTPATIENT CLINIC</th>
<th>INPATIENT AWAITING DISCHARGE</th>
</tr>
</thead>
</table>

### Does your patient need emergency oxygen

**YES**

Fax Air Liquid on 0800 7814 610 with a 4 hour response order (CC1). If patient has back-up oxygen at home he/she should contact the Air liquid on the provided number. **NOTE:** CC1 is valid for 3 days and then will automatically revert to standard HOOF.

### Is your patient hypoxic at rest or on exertion

**YES**

Arrange for temporary oxygen supply pending formal oxygen assessment at the Maple Unit, MKGH which runs Phase One assessments on Mondays. After this appointment oxygen patients will be contacted by Home Oxygen team to check on progress within 6-8 weeks. This information will be fed back to the respiratory team at the hospital. **See 2. Checklist for Primary Care.**

### Does your patient need short bust oxygen

**YES**

CC2 A= Less than 1.5 hrs
CC2 B= More than 1.5 hrs

SBOT should be considered for episodic breathlessness not relieved by other means in severe COPD, ILD, heart failure and palliative care with documented improvement. Arrange for short bust oxygen therapy (CC2 A= Less than 1.5 hrs, CC2 B= More than 1.5 hrs). Arranged in 3 days and is valid long term.

**NO**

### Does your patient need ambi oxygen

**YES**

**NO**

Most LTOT patient should be put on less than 1 hour a day on the same flow rate as LTOT. Please refer to oxygen clinic for formal assessment including a six minute walk test on oxygen via a cylinder. An exercise diary is recommended.

### Appropriate equipment for ambulatory oxygen

<table>
<thead>
<tr>
<th>Usage</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;90 mins</td>
<td>Small cylinder</td>
</tr>
<tr>
<td>90 mins-4 hours</td>
<td>Small cylinder with O² conserving device</td>
</tr>
<tr>
<td>&gt;4 hours</td>
<td>Liquid oxygen</td>
</tr>
<tr>
<td>&gt;30 mins if flow rate &gt; 2 l/min</td>
<td>Liquid oxygen</td>
</tr>
</tbody>
</table>

- Grade 1 – LTOT, low activity patient
- Grade 2 – LTOT, high activity
- Grade 3 – No LTOT, exercise desaturation (a fall of SaO2 of 4% below 90%) on exercise and an improvement in exercise capacity.
The clinical profile of patients who appear on monthly invoices but are not currently part of the specialist team caseload (ensuring assessment if appropriate)

From the findings, a business case is being prepared to improve patient follow up in the community by funding a community matron for one day a week to perform follow up home visits in line with British Thoracic Society guidance. The matron will also carry out a follow up assessment by Sp02 or CBG (Capillary Blood Gas) depending on the initial Sp02 outcome.

In addition, close working with the respiratory team, community matrons, NHS Improvement - Lung and regional leads is being maintained and work on the final adoption ladder (a model which will allow any similar health economy to rapidly implement specific changes to improve their local oxygen services) is planned to commence in April 2011.

Objective 2:
Improve ambulatory oxygen assessments (AOA) by carrying out a pre and post review evaluation of clinic set up and patients.

A clinic was started in October 2010 to run alongside the home oxygen service - assessment and review (HOS-AR) clinic. Evaluation of patients on AOA is undertaken by physiologist initial baseline analysis has been carried out with the following results.

From these results further work will be carried out to review the 145 patients identified as not having a walk test/ambulatory oxygen assessment (AOA). This will be carried out by the HOS-AR lead as some patients may have had tests at other hospitals and this will be documented in the original audit from 2009.

Objective 3:
Development of quality patient information questionnaire.

This is for use pre and post introduction of a patient leaflet to assess if the patient experience improves with the use of the leaflet and if there is any other way of improving patient experience.

A meeting with the project team and the NHS Improvement - Lung oxygen projects national improvement lead to discuss a possible questionnaire and its content occurred in September 2010.

Workload demands meant that substantive work on the questionnaire commenced in November, with the team incorporating the long term conditions (LTC) six questionnaire alongside 11 locally devised questions specifically around patient experience in the HOS-AR clinic.

The questionnaire was reviewed by (and gained approval from) the hospital clinical governance team. Use of the questionnaire started in January-March 2011, followed by (parallel) use of the patient information leaflet in order to compare outcomes and undertake a plan-do-study-act cycle of process improvement.

Issues and challenges they faced with potential solutions

- Staffing issues – see workforce considerations
- Lack of funding – project leadership has been resourced from a previous (non recurrent) PCT initiative and so uncertainty has arisen in respect of project completion. The team are trying to leverage the work to date in order to influence local decision-makers about the added value of the work continuing
- Rapidly changing NHS landscape – it is currently unclear whether existing PCT project support structures will be preserved within the new system architecture

Ambulatory Oxygen Audit
(Data from Oxygen Concordance Report Jul-Oct 2010)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patient accounts analysed</td>
<td>354</td>
</tr>
<tr>
<td>Total patients on AOX</td>
<td>243</td>
</tr>
<tr>
<td>Total patients had AOA/walk tests</td>
<td>50</td>
</tr>
<tr>
<td>Total RIP (on AOX)</td>
<td>33</td>
</tr>
<tr>
<td>Total paediatric (on AOX)</td>
<td>9</td>
</tr>
<tr>
<td>Total patients cancelled</td>
<td>6</td>
</tr>
<tr>
<td>Patients not had walk test</td>
<td>145</td>
</tr>
</tbody>
</table>
In addition, the impact on the respiratory team and the HOS-AR service of a potential merger of local hospital and community services is unknown at this point.

The project team is proactively seeking to both highlight the importance of this work (and thus raise the project’s profile) among the emerging GP commissioning consortia in order to ensure sustainability.

**Commissioning considerations**
Commissioning will be approached to approve the extended HOS-AR service business case, which will be focused around QIPP rather than primarily cost savings which the previous spend to save project was based on.

**Workforce considerations**
Current project leadership (obtained through fixed term contract working associated with previous PCT strategic initiatives) has reduced to 0.6 WTE and this may be further impacted by the additional workload required to project manage the oxygen contract re-procurement process.

Confirmation of continued funding has been agreed for the coordinator for this PCT (0.2WTE and the administrator 0.4WTE) the coordinator is also due to officially start as regional home oxygen project lead for the re-procurement of home oxygen for the South East region from April 2011.

**Potential/actual QIPP and cost savings /avoidance – defined as quality, innovation, productivity and prevention**
The tight cost regimen established in 2009 is still adhered to. However, the productivity gains seen from the initial quick wins achieved have reduced as the 2010 monthly expenditure has stabilised.

Further savings through inappropriate therapy withdrawal are less frequent as patient numbers have stabilised and the service undertakes the slow ongoing work of assessing the last few patients who have repeatedly missed their home oxygen appointments.

**Key learning**
**Project planning:** This has been a new experience for all members of this multi-disciplinary team as none of the project group had been involved in this type of systematic process improvement project before. Having a clear project plan is the key to success and this could have been more robustly developed at the outset.

**Data coordination:** Use of a HOS-AR database is important to control what is happening with patients. The team currently use a locally developed Microsoft Access database but use of the proprietary HoXAM database may be another for services setting up a new HOS-AR service. Further evaluation of the utility of local, national and proprietary oxygen data collection systems would be of value.

**Contract control:** This is central to the control of prescribing spend used to generate cost savings that can go towards funding a HOS-AR service. A review of short burst oxygen therapy patients in January has predicted a £6k cost saving and a further saving of £13k in AMB oxygen prescribing by reducing non users down to <1 hour a day before they are reviewed by the ambulatory assessment service.

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Improving the prescribing of oxygen across NHS Blackpool

NHS Blackpool

The background to the service
The PCT had a high proportion of patients using oxygen, 0.22% of weighted population on oxygen compared with 0.18% regionally, with associated higher (than the regional average) prescribing costs.

A preliminary audit undertaken in collaboration with secondary care in 2009 revealed that only 30% of patients on home oxygen had been assessed or reviewed by a clinical specialist.

This identified the risk that patients may be receiving oxygen inappropriately resulting in adverse clinical outcomes if prescribed not matching the patient’s clinical needs or patient in receipt of unnecessary oxygen.

Undertaking a review of the service through the work of NHS Improvement - Lung, provided the opportunity to improve patient outcomes and increase efficiency.

The project aims and objectives
• Develop an accurate oxygen register
• Identify number of patients receiving oxygen who do not meet the guideline criteria
• Identify the number of patients who have their oxygen therapy changed or discontinued
• Conduct urgent review of individuals receiving high/low dose oxygen to ensure clinical risks are managed
• Develop a structured assessment/follow up service which meets National Institute for Health and Clinical Excellence (NICE) guidance
• Increase the proportion of patients receiving a structured assessment from the current level (30%) to (80%) within time frame of project pilot

The process of improvement they undertook and overall approach to address the issues
A project team was established, comprising of staff from the NHS Blackpool and Blackpool Wyre & Fylde Hospital, and with facilitation from NHS Improvement - Lung. The current oxygen patient journey was process mapped in order to identify gaps in the service and potential risks.

Clinical engagement and commitment to the project was achieved through a multidisciplinary team of stakeholders. Respiratory specialists from the acute service, practice based commissioning, primary care and community clinicians and also included patient representation and feedback.

A paper data collection system was developed in advance of the home oxygen service (HOS) being established within a community setting.

Project members visited the regional oxygen data clearing house (LaSCA) in order to understand the process and to ensure data cleansing of the Blackpool oxygen register and on-going monitoring arrangements.

A referral pathway into the oxygen assessment clinics was developed and work has begun on developing a data collection system to capture patient number/type/oxygen and cost in terms of increase/decrease.

This information will be completed by the acute hospital HOS team and will be stored on the PCT system for evaluation and reporting analysis.
Self-care plans and patient information leaflets for long term oxygen therapy and ambulatory oxygen have also been developed.

The clinicians within the oxygen assessment service are now more clinically informed as they have access to Open Exeter which allows up-to-date history of individual home oxygen order forms (HOOFs).

**Issues and challenges they faced with potential solutions**

In the current climate attracting additional resources to pump-prime service developments is difficult so more work on demand and capacity is required. The project will need to provide evidence of improved cost effectiveness which can be demonstrated through the bespoke oxygen prescribing (and service) data collection system.

It has proved difficult changing culture and behaviour patterns within primary care healthcare professionals and also with patients. However ongoing educational opportunities to publicise the evidence around the need for formal assessment and review should address this and the project team are also developing primary care clinical champions and using them to guide and support others.

**The testing they did and key learning to date**

**Testing:** In order to address capacity issues an additional oxygen assessment clinic was piloted within a community setting. This increased the current service capacity by an additional 17 patients per week and over 60 previously un-assessed patients were invited to attend.

Initial invitations to attend this clinic resulted in a large number of patients who did not attend so the team undertook phoning individual patients in order to give more information about the service and benefits of attending (75 patients have gone through assessment but as at time of writing we still have three weeks of data to calculate in order to confirm final numbers).

**Key learning**
- The importance of developing an integrated bespoke data collection system that links to supplier data base and will calculate ongoing cost changes
- Developing a shared oxygen register between the oxygen assessment clinic, suppliers and LaSCA on a monthly basis, that is up dated and linked with primary care on a quarterly basis in order to ratify and data cleanse
- The importance of engagement with all stakeholders including practice based commissioning (PBC) as a potential forerunner of the GP Consortia. Meetings that have focused on holistic patient care to reduce NELs for COPD have facilitated this process

**Commissioning considerations (where appropriate)**
- Developing a business case
- Developing a service specification
- Inclusion in commissioning intentions for the acute contract

**Workforce considerations (where appropriate)**

The potential loss of key members of staff that are highly trained in their area of expertise poses a risk and so there is a need to ensure other team members work alongside them in order to up-skill through clinical supervision.

**Potential/actual QIPP and cost savings/avoidance – defined as quality, innovation, productivity and prevention**

Initial analysis have led to monthly cost saving estimates of between £3,000 to £4,000 compared with previous monthly spending patterns before the project work started.

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Wirral integrated oxygen service
Wirral University Hospital NHS Foundation Trust and NHS Wirral

Background to the service
The Wirral integrated service which incorporates a non-acute chronic obstructive pulmonary disease (COPD) and pulmonary rehabilitation service, was established in October 2009 following a long consultation and negotiation process between primary and secondary care.

The acute trust was commissioned by NHS Wirral to provide a comprehensive assessment and review service for potential and existing oxygen patients.

Prior to the service, outpatient oxygen assessments were undertaken on an adhoc basis by the nurse consultant in the secondary care chest clinic and follow up was lacking in structure. There was no database of patient assessment.

Oxygen invoices were managed initially by the Wirral medicines management team (MMT) and later by the Cheshire Health Agency. Concordance lists were reviewed by the MMT but there were no resources to reconcile or manage oxygen lists.

Since becoming an NHS Improvement - Lung pilot site, the Wirral Oxygen Service established referral processes, documentation, oxygen patient lists and a database for recall and review.

The oxygen lists were reconciled and obvious ‘quick wins’ were made by improving data management. Clinics for oxygen assessments were established and the process of contacting existing patients began.

Project aims and objectives
Mission statement: By the end of July 2011, all existing adult patients on Wirral prescribed oxygen will have had a structured assessment. New patients will be formally assessed before oxygen is prescribed and all patients will have a scheduled review programme. Patients who are prescribed oxygen will have the most clinically and cost effective treatment.

Specific objectives:
• All adult patients in Wirral should have a structured assessment prior to commencing home oxygen in line with national guidance. This excludes patients for whom oxygen is palliative for terminal illness
• Oxygen will only be prescribed if clinically indicated
• All adult patients on oxygen should be reviewed at least every six months to ensure their prescriptions remains appropriate for their needs
• Unnecessary oxygen prescribing should be eliminated
• An on going education programme for health professionals about the indications, prescribing and use of oxygen will be established

Issue, challenges and solutions
As an established service much of the groundwork had already been done in terms of setting up the service, developing referral and review processes and documentation.

Oxygen patient data had been ‘cleaned’ and the obvious ‘quick wins’ in terms of discontinuing inappropriately prescribed or no longer needed oxygen had been achieved.

Since joining the NHS Improvement - Lung project we have undertaken a review of our operational processes and altered documentation.
Improvement stories

The main aim of this was to record and reduce variance in assessment.

Data collection and metrics have been very challenging and obstacles still remain in providing the required data needed for NHS Improvement - Lung. Further ways are being developed for recording and retrieving relevant data in a way that is effective and efficient.

The team have employed a dedicated non-clinical oxygen coordinator with responsibility for data collection and managing the ‘oxygen list’.

The team have negotiated a pathway for referral for heart failure patients with the cardiac network group.

This aims to ensure that prior to referral for oxygen assessment, treatment will be optimised according to guidelines and existing heart failure patients on oxygen and labelled as palliative for more than one year will be reviewed by a heart failure nurse.

A review of the pathway for oxygen with patients who suffer from cluster headaches is being developed with the regional tertiary care centre. This aims to ensure that patients with cluster headaches who require a trial of oxygen therapy have the most clinically and cost effective option and receive regular review to ensure it meets their need. Ineffective treatment will be subsequently stopped.

A comprehensive risk assessment and escalation process for each patient on oxygen has been developed and is awaiting approval by the PCT.

**Next phase challenges**

As the team have now achieved most of the quick wins, there is a need to continue to find ways of achieving further cost reduction or at least maintaining what has been achieved. This will be done by continuing to educate and promote the benefits of accurate assessment and working closely with primary care.

Concordance data is being used to challenge under or non-users of prescribed oxygen and we are starting a review clinic in two key GP practices where this is a particular issue. It is hoped that this approach will lead to joined up working with GPs, help them to understand the issues better and provide a template for how best to tackle patients who are not using oxygen but refuse to have it discontinued.

The service is now facing challenges from patients who are on oxygen without any clinical indication. The aim is to withdraw oxygen without losing the trust of patients and GPs and inadvertently increasing admissions or use of other health services. We are starting to collect data on patients who have had oxygen withdrawn to measure the effect.

**Potential and actual QIPP and cost savings/avoidance**

The data collected shows a reduction in overall oxygen use and a cost reduction of £5k-£7k per month since the service began in October 2009. In addition, following formal assessment, 80 patients have not proceeded to oxygen treatment leading to further significant cost savings.

The number of non-specialist, non-palliative oxygen prescriptions each month is reducing significantly. This is largely as a result of promoting the service at every opportunity through educational events and one to one meetings at GP practices.

The team have now completed an assessment and review of 80% of all existing patients on oxygen. Remaining patient assessment will be completed by April 2011.

The team are now collecting data on potential cost savings made from changing charge bands.

It is likely that costs will either level out or even rise in the next few years. However provided there is continuing support for the oxygen service and data management, costs will be as a result of better management and assessment.
Data collection

**Adult patients on oxygen**

- **Cumulative savings**

- **Patients discontinued after review**
Emerging workstream principles
- Get the database right to avoid duplication of data collection
- Decide and agree metrics at the start so data collection is relevant
- Identify a dedicated data and/or oxygen coordinator to support clinical work
- The process of review cannot be undertaken as a paper exercise
- Patients sometimes suspect an ulterior motive to the reassessment process and believe it is more about saving money than providing a quality service
- Engage with GPs about their patients from the start to get support with decision making

Process mapping
Following a comprehensive service process mapping exercise in September 2010, objectives for each part of the service were drawn up and agreed. This will be repeated annually (see Page 62).

Service evaluation
Users of our total service (which includes COPD and pulmonary rehabilitation as well as oxygen assessment and review), have had their experiences evaluated by Manchester Metropolitan University.

A further series of patient focus groups specifically for patients on oxygen took place in March 2011 and a brief summary of the results showed that 163 patients seen by the team replied to the survey.

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<table>
<thead>
<tr>
<th>Questions</th>
<th>Unsatisfied/very</th>
<th>Neutral</th>
<th>Satisfied/very</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPD/02 staff checked everything about my respiratory problems at the start</td>
<td>11 (5.8%)</td>
<td>12 (6.4%)</td>
<td>145 (77%)</td>
</tr>
<tr>
<td>I feel better in myself and I manage my condition since starting with oxygen service</td>
<td>11 (6%)</td>
<td>27 (14.4%)</td>
<td>130 (69.2%)</td>
</tr>
<tr>
<td>The respiratory team provided me with all the information I wanted to know about my condition</td>
<td>13 (8%)</td>
<td>12 (6.4%)</td>
<td>147 (78%)</td>
</tr>
<tr>
<td>I felt I was treated with dignity and respect</td>
<td>9 (4.8%)</td>
<td>9 (4.8%)</td>
<td>148 (78.7%)</td>
</tr>
<tr>
<td>I had confidence and trust in the staff examining and treating me</td>
<td>9 (4.8%)</td>
<td>13 (6.9%)</td>
<td>146 (77.6%)</td>
</tr>
</tbody>
</table>
Home oxygen – improving quality of care

Sherwood Forest Hospitals NHS Foundation Trust and NHS Nottinghamshire County Community COPD Team

The background to their service

Three specialist oxygen assessment (community-based) clinics were established in 2006 for patients referred for assessment by secondary care.

These clinics form part of a high quality community chronic obstructive pulmonary disease (COPD) service which is led by a consultant respiratory physician and forms a constituent part of a managed clinical (COPD) network aligned to practice based commissioning consortia.

A number of problem areas have been identified within the current oxygen pathway:

- Oxygen prescribing is undertaken by any local healthcare practitioner (HCP) often without prior formal clinical assessment
- Misconceptions among HCPs and patients around the role and purpose of oxygen
- Poor knowledge of the assessment process
- Variable patient education on the purpose, safe and optimum use of the therapy
- Poor understanding of the ordering process and the cost implications
- Life-long therapy costing the local NHS £millions in inappropriate prescribing
- Only 52% of patients have evidence based reviews
- Inconsistent messages and variable level of patient information

These issues generate a number of concerns in respect of patient care:

- Sub-standard clinical service for non-assessed patients – leading to unnecessary life-long therapy for some patients
- Inequity of provision across the PBC areas – only 52% of patients have evidence based clinical assessment

The project aims and objectives

The project aims to assess:

- The uptake of GP direct access to the oxygen assessment services
- The workload implications of performing retrospective oxygen assessment for patients never assessed
- The introduction of a standard pathway for patients discharged with oxygen following admission

The process of improvement they undertook and overall approach to address the issues.

Direct access: A direct access pathway (see below) was devised for introduction to GP practices on a rolling locality-by-locality basis.
The project team met with practice nurses and managers to share the community referral form, pathway and protocol.

An active review of concordance lists was undertaken in order to facilitate patient recall and target practices for individual GP surgery education and engagement visits.

Guidance notes were drafted for local GP practices on improving patient concordance and invoice validation / patient register data cleansing was undertaken by PCT finance and primary care commissioning teams.

Hospital discharge prescribing: Secondary care oxygen guidelines were jointly devised between the respiratory team and other medical departments and submitted to the hospital clinical governance officers.

To improve the support provided at discharge (for COPD patients following non-elected admission), a nurse-led clinical check list and discharge information pack is being developed. The pack will include prescribing guidelines for discharge oxygen, self management information and action plan, standard patient information and follow up oxygen assessment appointment.

COPD home oxygen pre referral pathway

Cost control and data management: Responsibility for data management is being devolved to the practice based commissioning (PBC) groups who are in the process of organising invoice reconciliation which will ensure deceased and out of area patients are identified and removed from the billing system.

The clinical project team commenced home oxygen order form (HOOF) amendment/oxygen charge band re-categorisation of patients known to the service in August 2010. Patients attending for review have all oxygen supplies re-categorised according to clinical need.

In October 2010, the clinical project team was granted access to the monthly oxygen supply invoice and commenced work to resolve supply modality anomalies.

Issues and challenges they faced with potential solutions

Primary care engagement: This has been challenging as follow-up meetings to the initial round of discussions (about the referral protocols and assessment process) were difficult to arrange and feedback about the new direct access pathway has been variable from one locality to the next.

The project team exploring the development of oxygen champions from among general practice to assist in the development of good practice among their peers.

Workforce considerations

The project team is comprised of a clinical scientist working in partnership with a consultant respiratory physician and a community COPD team.
**Potential/actual QIPP and cost savings/ avoidance – defined as quality, innovation, productivity and prevention**
To date, 36 patients have been re-categorised by the clinical project team resulting in a projected saving £24,209 per annum.

Re-categorisation consisted of reducing hours of usage, reducing oxygen flow or removal of supply.

**Key learning**
**Health inequalities:** Analysis of the oxygen patient data has highlighted the inequities of the current system where at least 50% of patients have the therapy prescribed without referral to the oxygen assessment service whilst the other 50% of patients receive an evidence-based, gold standard service.

**Service integration and productivity:**
The work of the project team to date has demonstrated the potential for making financial savings from regular review and re-categorisation of supply. The savings were achieved amongst those patients known to the oxygen assessment service and to the community pulmonary rehabilitation service e.g. integrated community services with shared specialist staff.

The clinical review and charge band re-categorisation work will continue and further savings will be achieved; however maximising the potential savings is undermined by continuing oxygen prescription without referral to the oxygen assessment service.

**Future work:** The next phase of the project will examine how to include GP practices in the retrospective assessment process (e.g. assessing patients with oxygen supplies and no record of assessment). The partnership with Sherwood Forest Hospital will continue to develop and implement a discharge pack and assessment its impact on the oxygen assessment service workload will be examined.

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Improving home oxygen services through pathway redesign

NHS South Staffordshire

The background to their service
Prescribing costs in South Staffordshire have increased by 30% since 2006 and recent analysis has predicted that this trend would continue through 2010/11.

The following issues with the current service were highlighted:
- Lack of understanding amongst primary care clinicians regarding home oxygen order form (HOOF) completion coupled with inappropriate prescribing of oxygen for patients outside the guidelines
- There is a lack of understanding amongst healthcare professionals regarding the prescription charges per oxygen flow rate
- Poor compliance and extreme over/under use by patients on oxygen
- Lack of specialist assessment for palliative care patients
- Secondary care oxygen assessment occurring but follow-ups not meeting national guidelines
- Escalating costs due to clinical prescribing anomalies invoicing errors: invoicing for deceased patients, incorrect oxygen mode charges, patients not registered in the PCT, patients with duplicate accounts, oxygen that has been removed and still being charged

537 patients were known to be in receipt of home oxygen within Cannock Chase locality, of which 149 are known to the community respiratory team (127/149 patients having chronic obstructive pulmonary disease (COPD)).

The project aims and objectives
This project centres on the Cannock Chase locality having been approved by NHS Improvement - Lung in October 2010 (commencing the following month), after the initial South Staffordshire project in East Staffordshire locality failed to progress.

Aim: To address the issues arising from the lack of a comprehensive oxygen assessment and review service through pathway redesign in line with national guidance and best practice.

The specific issues of patient safety, usage and compliance will be addressed to ensure appropriate prescribing of oxygen, leading to cost effective and appropriate delivery of treatment and a reduction in hospital length of stay (LOS).

Objectives:
- Improve patient safety
- Evidence based treatment
- Improve quality of life and reduced mortality (long term oxygen therapy (LTOT) group)
- Reduced LOS (LTOT group)
- Cost savings
- Reduce inequalities
- Improve patient experience
- Adhere to British Thoracic Society (BTS) and condition specific clinical guidelines

The process of improvement they undertook and overall approach to address the issues
The project team sought to demonstrate the cost-saving potential of the approach outlined below and thus help inform wider health economy work on whole (respiratory) service redesign and Quality, Innovation, Productivity and Prevention (QIPP) efficiency.
The team undertook an initial data review of all patients in receipt of home oxygen in the Cannock Chase locality with phone contact reviews and face-to-face patient reviews to all existing Cannock Chase community respiratory team caseload.

Patients not on the Cannock Chase community respiratory team caseload may be contacted where oxygen prescribing data suggested:

- Over or under use of oxygen
- Multiple orders running concurrently
- Anomalies in prescribed flow rate / hours usage

At the time of writing the project team had reviewed 103 patients. For 91 of these patients there were under use or clinical reasons to change the prescribed oxygen order to one more appropriate to the patients clinical condition and existing oxygen usage. In all 91 patients the changes made to the oxygen order attracted a less expensive tariff, reflecting more appropriate oxygen treatments with optimal cost efficacy.

**Issues and challenges they faced with potential solutions**

The capacity of the project team to deliver the clinical reviews and to ensure returns are completed submitted in a timely fashion has been an ongoing challenge to the delivery of the project.

The project work is aligned to wider PCT long term conditions (LTC) and Department of Health LTC ignition projects and additional demands are now made in respect of the cardiac and stroke portfolio.

These issues will be offset slightly through industry partnership working with Astra Zeneca who offered analyst support around data collection.

**Workforce considerations**

**Staff time:**

91 patients reviewed at 30 minutes per patient

Total time for 91 = 45 staff hours

Cost saving per hour of staff time = £1,265

**Potential/actual QIPP and cost savings /avoidance – defined as quality, innovation, productivity and prevention**

Each patient order generates a cost using a tariff that reflects prescribed flow rate and hours usage. This tariff has 47 codes with a range of ‘per day costs’ fixed against the prescribed flow rate and hours usage.

These costs are paid regardless of the actual flow rate and hours usage and in many instances the patients reviewed were not using their oxygen in keeping with the prescribed usage.

Review of these patients allowed the project clinicians to review the clinical basis for the oxygen prescription and where appropriate match actual oxygen usage to the prescribed oxygen usage. In all instances where a change in prescription (and therefore tariff code) was made, the resulting code was cheaper.

At least 10% patients were moved to a less expensive tariff with forecast savings in excess £1k per year.

The total annual forecast cost savings attributable to the review of the 91 patients in Cannock Chase locality amount to £57,573.

**Key learning**

**Complexity:** This work has uncovered a lot of complexity within existing data collection and administration systems for home oxygen, which pre-date the creation of a single PCT from four separate organisations. Thus they are complex, fragmented and difficult to monitor.

In addition, there is very limited administration support to process orders and invoices, with little analysis of data provided and this function is remote from clinicians ordering home oxygen.

**Competences:** Clinicians in GP surgeries have limited knowledge of the type oxygen to order and in some cases prescribe inappropriately. In some instances the order form is completed by non clinical staff. A GP training programme would help improve prescribing habits. The Cannock respiratory team are uncovering a large number of inappropriate orders.
A centralised and integrated oxygen assessment, review and ordering team would prevent this happening and relieve GPs of the burden of completing home oxygen order forms (HOOFs), a task which is often delegated to non clinical staff.

**Financial control:** The PCT oxygen budget has remained part of the overall pharmacy budget. However, oxygen spending is not monitored and PBCs have remained unaware of the amount spent in their consortia. An initial review suggests that one half of the PCT has more patients on home oxygen but that the other half of the PCT consistently spends much more per patient.

By sharing the practice spend with each PBC this will increase the interest in the robust management of this budget and that systems are put in place to ensure the right patients receive the right supply of home oxygen, with a review system in place.

A future pathway redesign work priority is to review the processes associated with the prescription of the high cost supply of oxygen on an ‘emergency’ basis, i.e. delivered to the patient within four hours.

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Improving home oxygen services
NHS Birmingham East & North and Heart of England NHS Foundation Trust

NHS Birmingham East & North (NHS BEN) and Heart of England NHS Foundation Trust (HoEFT) are working in partnership to change the way in which oxygen services are delivered to our community.

The project team aim to deliver and embed a cohesive approach that leads to clinically effective and cost efficient oxygen management processes across the local health economy.

The background to their service
NHS BEN first embarked on addressing the way oxygen services were managed in 2007; the approach taken at that time was to aim to secure a designated post with funding support from the British Lung Foundation (BLF).

Differences between the BLF funding cycle and PCT business case development process prevented funding being within specified timelines and therefore no further plans were developed to address the review assessment pathway.

The approach from that point forward was to robustly manage the internal mechanisms and to ensure that contracting information was kept up to date (removing out of area and deceased patients) whilst this was an effective approach to data quality, the effective assessment of all patients on home oxygen could not be undertaken.

Oxygen is predominantly initiated by secondary care clinicians; however the processes vary across the sites (Heartlands and Good Hope Hospitals). There are respiratory clinics which review and assess patients referred however as initial home oxygen order forms (HOOF) are completely by any clinician the system can be quite fragmented.

Within NHSBEN the responsibility for commissioning oxygen services has moved from primary care contracting to within the long term conditions team responsible for chronic obstructive pulmonary disease (COPD).

The information systems that support the management of oxygen across the health economy reside within stand alone systems that are inaccessible to the three sites across the local health economy. There was some enthusiasm to create a systematic approach to the review and assessment of patients that had been on oxygen for a number of years and to put in place pathways and processes that demonstrate effective review of concordance reports.

For those patients commenced on oxygen from hospital (under specialties other than respiratory) there is a need for a pathway that establishes confidence that further review will take place as part of the ongoing patient management.

To support and underpin this there will be a review and revision of local guidelines for prescribing home oxygen therapy.

The project team have process mapped the patient journey in terms of the current and future state and identified where gaps exist in current provision, and how in the longer term we envisage a move towards single point of referral for initial oxygen assessment and prescribing.

The project aims and objectives
• To work in partnership to change the way in which oxygen services are delivered to our community.
• To embed an approach that leads to a cohesive, effective and cost efficient oxygen management process across the NHS BEN and HoEFT Health economy.
• Develop transparent systems for sharing information relating to home oxygen users across the local health economy
• Agree a clear and transparent pathway and guidelines that support the process of initiating oxygen therapy for new patients and advises on the challenges of withdrawal/cessation
• Scope the requirements for a single database across the sites which will facilitate review assessment requirements
• Involve the support of clinical health psychology to establish an approach which is consistent with models of best practice in reducing psychological dependency
The project will review the information currently held at NHSBEN as this forms the basis on which contracting and charging takes place. With the information from secondary care and data supplied from the oxygen provider we will prioritise those patients that require a review assessment with the intention of ensuring that only those patients that meet the clinical criteria continue with this treatment. The process of improvement they undertook and overall approach to address the issues.

Following the development a project plan a programme board was established, inviting members from across community and secondary care under the clinical leadership of a respiratory physician.

The team have taken the approach of ensuring multidisciplinary representation and this has gained the support of respiratory physiotherapists and health improvement specialists.

The project has been communicated to local GP localities in order to ensure they are aware of the intended outcomes and this has also received positive feedback.

**Issues and challenges they faced with potential solutions**

One of the key issues has been the ability to secure continued commitment from community teams, particularly as the project has taken place during the key stages of the Transforming Community Services programme. There have also been some issues to overcome in terms of communicating the project in secondary care, it was important that executive sign up translated into commitment and engagement from the managerial and clinical teams to the objectives.

The transfer of information between sites has required input from information governance leads in order to comply with legal requirements relating to information sharing. A protocol for information sharing is being developed and the team have been briefed in relation to the appropriate level of information shared across organisations.

Of course the current organisational turbulence has resulted in some loss of momentum due to increasing workload and conflicting priorities but due to the commitment and focus witnessed from the team this should not be a barrier.

The testing performed and subsequent key learning witnessed has already resulted in overall benefits encountering secondary care establishing a clinic with no waiting list and therefore it seemed appropriate to re-assign it as a multidisciplinary clinic with consultant input for the purpose of the project. A ‘test’ cohort was not chosen based on reviews highlighted in the concordance report and those who have previously had an assessment where clinically oxygen could have been withdrawn but patients were reluctant and fearful of relinquishing this.

The team commenced clinics on 5 January 2011, assessing approximately four to eight patients per week, it has been recognised that we will need a process to request the permission of other consultants prior to reviewing non respiratory patients.

One aspect of key learning to date relates to home oxygen order forms (HOOF) which have limited information recorded in terms of coding of patient diagnosis also the transfer of HOOF forms across organisations is fragmented. As such it is a challenge to clearly define and group patients in receipt of oxygen by their diagnosis.

**Commissioning considerations**

As new funding is not anticipated the management of oxygen therapy has been entered into the commissioning intentions of both the acute and community provider contract for 2011-12. This project will enable us to test this service and more accurately specify the requirements for the future.

**Workforce considerations**

The reviews are carried out by a respiratory physiology technician supporting the respiratory consultant. This clinic will (once workforce is confirmed) include a nurse and physiotherapist establishing a truly multidisciplinary approach. In the interim patients who require nursing input are highlighted to the respiratory nurse specialists.
Potential/actual QIPP and cost savings/ avoidance – defined as quality, innovation, productivity and prevention

As mentioned above the PCT based oxygen database has been robustly managed in terms of data cleansing and quality. As such NHS BEN does not anticipate the significant savings that other organisations will experience.

However, the team recognise the guidance in terms of indications for using SBOT and will be striving to appropriately withdraw this where possible.

Also, as there are a number of patients who have not been reviewed we expect the project to deliver a number of cessations following review, unfortunately this is not easily quantified at this stage.

However, based on the current PCT spend on oxygen applying the nationally quoted saving projections would result in a local reduction of approximately £200k.

Data summary

Baseline activity has been collected from across the three sites, there was an existing list of patients who were considered borderline for withdrawal from the first assessment and this group are now being invited for review, whilst the team review concordance information.

The information manager has produced some valuable and insightful reports from the contracting data held by NHS BEN. This includes analysis on the number of admission for patients on home oxygen and those with a diagnosis of COPD.

Alignment with QIPP framework

<table>
<thead>
<tr>
<th>Quality</th>
<th>This project will bring about whole system improvement in the clinical identification and management of patients on Oxygen. Improving quality of service provision and patient QoL. This also includes the right treatment at the right time with appropriate patient support.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation</td>
<td>Whilst locally our organisations have attempted to address this issue it remains largely disjointed, the approach of a structured Oxygen ‘snatching’ clinic creates a consistent approach that addresses inappropriate interventions and creates a robust framework for the future.</td>
</tr>
<tr>
<td>Productivity</td>
<td>Improving this pathway through this project enables the organisation to maximise the benefit of every pound spent on management of this disease.</td>
</tr>
<tr>
<td>Prevention</td>
<td>An emphasis on supporting patients to self care, is reflected in our strategic priorities, we will use existing services to support this e.g. healthy incentive schemes, health trainers, BOH, Expert Patient Programme and disease specific education approaches.</td>
</tr>
</tbody>
</table>

Emerging workstream principles, including ‘top tips’

Top tips for the management of the oxygen service are:
- The earliest quick win for oxygen therapy is active and robust data quality this requires a committed information manager and establishment of processes to reconcile disparities in information, remove deceased patients and alert in terms of movement out of the area
- If clinics will take place in secondary care agree on the tariff that will be applied
- Input into the oxygen clinic to effect safe and sustainable service (by identifying high risk patients) with development of a system of ‘inappropriate oxygen cessation’ notices
- Ensure commitment of secondary and community care teams from the outset, both clinical and managerial
- Explore the requirements for information sharing across organisations and any associated protocol needed
- Establish how the system of managing HOOF forms works prior to implementing a project
- Explore the establishment of a single point oxygen assessment initiation process with secondary care to streamline
- Consider psychology advice for those patients who are particularly dependant or lack coping skills
Any generic learning (LTC) that we extrapolate from the work e.g. how this could be applied to other area’s

- Clinical leadership in the process is key, also the engagement of the wider specialist team e.g. respiratory physiology, nursing and physiotherapy
- Evidence of other similar projects and their associated saving to engage finance leads and demonstrate good practice from elsewhere
- Early identification of where the pathway would be placed in an established model e.g. community, secondary care or within a private provider
- Engage commissioning to ensure that you are aware of the current contract and who is monitoring it
- Data to align information with GP practices which is linked to concordance reports
- Engage GP consortia to ensure the project has support and buy in, engagement with clinical lead may assist in terms of reinforcing the message to patient and clarifying the indications for oxygen therapy

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Data for improvement projects

What data is available to support home oxygen sites?
Primary care data is often seen as a difficult area to extract data, and our sites found it difficult to access primary care data at first. However, a number of resources are easily available which can provide a picture of primary care which is valuable for improvement work (further details on how to access this information, and how to analyse it, are in the data section below).

Quality and Outcomes Framework
The Quality and Outcomes Framework (QOF) is a voluntary annual reward and incentive programme for all GP surgeries in England, detailing practice achievement results. It is not about performance management but resourcing and then rewarding good practice.

QOF data is useful, particularly for building evidence and understanding around the diagnosis and community parts of the patient pathway. QOF data is particularly valuable when compared to other indicators for chronic obstructive pulmonary disease (COPD), such as admissions, or expected prevalence. Comparing the proportion of patients predicted to have COPD against actual reported COPD on QOF may highlight areas of unmet need, find missing populations, and suggest where to target support and future work.

QOF may be useful for COPD projects, as it provides annual information on the following indicators:

- The percentage of patients with COPD who have had influenza immunisation
- The percentage of patients with COPD with a record of FeV1 in the previous 15 months
- The percentage of all patients with COPD diagnosed after 1st April 2009 in whom the diagnosis has been confirmed by post bronchodilator spirometry
- The percentage of patients with COPD who have had a review, undertaken by a healthcare professional, including an assessment of breathlessness using the MRC dyspnoea score in the preceding 15 months

It also collects figures on the reported prevalence of COPD.

It is important that sites using QOF review any exception reports, as it is possible to exclude patients.
Data for improvement projects

NHS Comparators
NHS Comparators has been much developed in the last year, and sites were impressed with the information it provided, which helped provide basic benchmarking and comparison for primary care.

For a general view of data, NHS Comparators can provide suitable information for many areas. The site provides total admissions data on a quarterly or annual basis, from SHA to Practice level. The site includes functionality to plot data on charts and maps. Data can also be exported for local use in Excel.

The NHS Comparators tool is free to access, and is not limited to NHS staff. There is a set of COPD measures, which includes:

- Total admissions for COPD
- Emergency and planned admissions,
- Reported prevalence compared to predicted prevalence

General Practice Systems
Local investigation of primary care data may reveal more information. Project sites have found value in interrogating the information held within primary care systems. The importance of accurate coding has been emphasised by project sites, sites have learned more about the exacerbations of their patients by ensuring coding is correct.

Primary care data can be explored using the reporting functions built into primary care systems, or using external tools, examples of which include the POINTS audit tool from GSK, and the Optimal Patient Care Project. Details on how to access these resources are in the data guide.

GSK POINTS audit tool
Access to practice information is essential for projects involved in End of Life care work, it is estimated that 14% of EOL registers may be COPD patients. Ensuring that this information is accessible, coded well, and used will support the EOL care pathway.

The NHS Information Centre is planning to improve access to GP information through the development of a national GP data extraction service. For further information visit the information centre website. www.ic.nhs.uk
Programme Budget Interactive Atlas
A recent development is the Programme Budget Interactive Atlas. This contains a variety of indicators at PCT level, and can be useful in comparing PCT level data. To access the Programme Budget Atlas, you require access to the NHS Network, and access the site via www.nchod.nhs.uk

The Programme Budget Interactive Atlas is a tool available to plot a number of respiratory indicators and compare nationally, within an SHA, or with similar PCTs. This interactive tool cap map, and show correlations between two indicators (for example, cost and outcome).

Accessing HES data locally
Many sites have found access to HES data through using local performance reports. These reports typically include averages for length of stay, numbers of admissions and readmissions, and are typically used for performance management.

For process improvement, it is often valuable to get this information at an individual level. This will be best used to show individual variation in Length of Stay, rather than the average.

If you have access to an information analyst who can extract the data from the acute trust or commissioner databases, then you can have a more flexible approach to accessing admissions data.

Public Health Observatories
Each region has a Public Health Observatory (PHO), who's role is to support clinicians and commissioners access information on the health of the population. In addition, each PHO has areas of specialist interest. The Eastern Region (ER) PHO has the specialist interest for respiratory illness – and a number of data sources and reports are available from their website at: www.erpho.org.uk

SHA benchmarking and Information packs
The Department of Health in conjunction with the ER PHO and National Programme Budgeting team have produced a respiratory health information pack for each SHA area. These packs cover a variety of indicators, that highlight the difference in expected prevalence, diagnosis, admissions, spend and outcome across all SHAs nationally. These can be downloaded for your SHA area from the NHS Networks site at: www.networks.nhs.uk

National Programme Budget Interactive Atlas – http://nww.nchod.nhs.uk (NHS Network connections only)
Tobacco Control Profiles

The London Public Health Observatory has produced a smoking profile, which may be useful for projects planning and developing smoking cessation services. These are available online, at the following address www.lho.org.uk/LHO_Topics/Analytic_Tools/TobaccoControlProfiles/

Guide for building support from data analysts and experts

Many of our project sites have emphasised the benefits from getting early support from a dedicated data analyst. This has helped projects in obtaining baseline information, supporting process mapping, and ongoing support to monitor improvement.

The key tips for getting and keeping analysts involved in projects are:

Get your analyst involved early

Sites that included analyst support from the beginning had a head start with data, and rapidly built the evidence base and understanding for the service change. Those sites without analyst support struggled to understand the importance of data, and later expressed regret as data revealed challenges or misunderstandings which could have been challenged sooner. Early involvement helps ensure that you and the analyst have a shared understanding of the project.

Involving analysts closely with the project, rather than an external function

This close involvement ensured the analysts had a greater understanding of the purpose of the projects, and the analyst could input into the project goals to ensure the aims are measurable and achievable. It is also valuable, as it may reveal other sources of information or approaches which may be unknown to the project team.

Seek formal support from the analyst and manager

Analysts are often seen as a valuable resource, and as such their time may be protected. Some sites have found difficulties in maintaining analyst support in projects due to competing pressures elsewhere in the organisation. Sites have recommended that you ensure management support is in place for the improvement work, ensuring that analyst time is made available to support your work.

Look widely for your support

People with access and expertise to data may not always be in analyst roles. Sites looking for information may wish to contact performance managers, clinical coders, data managers and contract managers, who exist in a variety of roles, supporting the management of PCTs and Provider trusts, with access to data being a core part of their roles.

Be clear on data requirements to information departments

It helps to explain what you are trying to measure or demonstrate, as they may be able to suggest alternative indicators. As well as information analysts, involve all those involved in delivering care to contribute to a data collection plan.
Appendices

The following appendices are an initial sample collection of resources (letters to patients, care pathways and algorithms, assessment forms etc.) which may prove helpful to other NHS colleagues about to embark upon similar work. This initial set of resources will be substantially added to when the final publication marking the end of the project cycle is published.

Newham LTOT pathway

Long term oxygen therapy (LTOT)
Newham Development Zone > Thoracic medicine > Home oxygen therapy (HOT)

IMPORTANT NOTE: Locally reviewed refers to the date of completion of the most recent review process for a pathway. All pathways are reviewed every twelve months, and on an ad hoc basis if required. Due for review refers to the date after which the pathway on this page is no longer valid for use. Pathways should be reviewed before the due for review date is affected.
Royal Free/Waltham Forest PCT/NECLES HIEC
Flow chart

OPH Health professional identifies patient needing oxygen assessment:
• Patients exacerbating who require oxygen for home management.
• Patients on oxygen who have been assessed and require F/U.
• Patients on oxygen not previously assessed.
• Patients with moderate (FEV1 50-79% predicted) or severe (FEV1 ≤40%) and very severe (FEV1 ≤30%)
• Poorly controlled symptoms i.e. progressive breathlessness and reduced activity i.e. becoming increasingly disabled by condition.
• Patients with clinical signs of hypoxia e.g. cor pulmonale, principally peripheral oedema, polycythaemia, raised jugular venous pressure, cyanosis, SpO2 ≤ 93%.
• Patients with 65% breathing air.

Oxygen saturation measured with pulse oximeter by practice health professional if available.

• SpO2 of ≥92% and ≤92%.
• Consider other co-morbidity and referral for definitive diagnosis.
• Consider smoking cessation.
• BMI ≥19 or ≥25 refer to dietician.
• Consider short burst oxygen if desaturates to relieve breathlessness and review annually if implemented.
• Consider Ambulatory oxygen assessment.
• Consider discussion around Preferred Place of Care, Register on Gold standard framework for palliative care, Social services, Intercare Services.
• Long term management via primary care.

Refer to Community HT/ Pulmonary rehabilitation Services

Respiratory assessment / Triage
Has patient: Confirmed diagnosis, recent chest X-ray SpO2 ≥ 92% on air at rest, optimal medical management and no evidence of other co-morbidity.

YES

SPECIALIST/HOT
• Respiratory initial assessment.
• CBG/LOT testing.
• Follow up 3 weeks.
• Complete HODF form.
• Links with O2 provider.
• Inform PCT and GP practice.

4 week follow-up
• Home visit by HOT Nurse / CBG.
• Includes clinical assessment, risk assessment and education.
• Discontinue O2 if values normal.

3 month follow-up
• Review by HOT Nurse / CBG / Hospital outpatient if clinical concern.
• May include lung function, ABGs.
• Discontinue O2 if values normal.

6 month follow-up
• Home visit by HOT Nurse.
• Includes clinical assessment, risk assessment and education.
• Discontinue O2 if values normal.
Dear
Re: NHS Improvement - Lung

I am writing to invite you to join this new initiative that is being developed nationally to improve the care and services we deliver to people with lung disease. In Waltham Forest we are specifically offering an opportunity to people who have been prescribed oxygen to manage their breathlessness. Extensive research has shown that whilst oxygen is linked to breathlessness, there is negligible evidence to show that it is of benefit. Unfortunately dependence on oxygen frequently occurs which prevents patients developing techniques and skills that enables them to manage their breathless more efficiently - without the use of oxygen.

I would like to offer you the opportunity to work with a Respiratory Specialist to help you to develop breathing techniques which enable you to improve the control your breathlessness.

This will be managed through a time table of home visits to:

• Discuss your use of home oxygen.
• Offer full assessment of your requirement for oxygen therapy
• Teach you techniques to manage your breathlessness and review your progress at regular intervals.
• Address your concerns and work with you to build your confidence in the self management of your breathing without the use of oxygen.

You will be supported throughout the process and encouraged to monitor and discuss your development at each stage. When this point has been reached, with your agreement the oxygen will be withdrawn. You will continue to receive support visits and telephone support for six months. If you feel you are unable to allow the withdrawal of the oxygen you will be offered an appointment with a Respiratory Consultant for further discussion and assessment.

I hope you will take up this unique opportunity that has the potential to make a real difference to the management of your breathlessness. If you do not wish to take part please call me on 0208 430 8255. This decision will not affect your usual care.

I look forward to working with you.

Yours sincerely

Anne Crawford
Respiratory Nurse Specialist
Team Leader
Waltham Forest Respiratory Services
# Royal Free/Waltham Forest PCT/NECLES HIEC - Patient proforma

<table>
<thead>
<tr>
<th>Date of assessment:</th>
<th>NHS Lung Improvement Programme (NHS Waltham Forest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient name:</td>
<td></td>
</tr>
<tr>
<td>DOB:</td>
<td></td>
</tr>
<tr>
<td>NHS No:</td>
<td></td>
</tr>
</tbody>
</table>
| Date SIBOT Prescribed: | SIBOT Prescription:  
| Prescriber:         | Actual use:                                          |
| Explanation/information of LIP project given: | Patient consent to be involved:  
| (or reason for decline) |                                                      |
| Diagnosis:          | Medication Review  
|                      | Inhaled medication  
|                      | Comments on technique:                                |
| PMH                 |                                                      |
| Clinical status:    | No. exacerbations in past 6/12:  
| stable / exacerbating | No primary care visits in past 6/12:  
|                      | No. Admissions in past 6/12:                          |
| Smoking History:    | Pack yrs:                                              |
| MRC:                | Current symptoms:  
|                     | Spirometry  
| SpO2 on air at rest: | FEV1 \(\%\) predicted:  
| SpO2 on air post exertion: | FVC \(\%\) predicted:  
| ABG /CBG:           | FEV1/FVC Ratio:                                      |
| PH \(PO2\) \(PCO2\) \(HCO3\) \(SaO2\): | BORG pre activity:  
| HAD SCORE:          | BORG post activity:  
| Anxiety <-  
| Depression-  
| SORQ SCORE:        | Time to recovery O/A:  
| Action Plan/comments: | BORG post activity:  
|                      | Time to recovery on SIBOT:                           |
|                      | Interventions:  
|                      | Breathing control techniques:  
|                      | Paced breathing on walking:  
|                      | PLB □  
|                      | Pan:   Static □  Hand held □  
|                      | Inhaled medication use...  
|                      | relaxation techniques  
|                      | Pain /anxiety management CBT □  
|                      | Pulmonary rehabilitation  
|                      | Palliative symptom management  
| Review date:        | Patient information given:                           |

---

**Note:** The information provided is a structured format for recording patient data related to lung improvement programmes in the context of the NHS Waltham Forest. It includes details such as patient demographics, medical history, clinical status, smoking history, and a review of current symptoms and interventions. This form is designed to facilitate comprehensive care and monitoring for patients with respiratory conditions.
### Royal Free/Waltham Forest PCT/NECLES HIEC - Follow-up proforma

<table>
<thead>
<tr>
<th>Patient name:</th>
<th>NHS Lung Improvement Programme (NHS Waltham Forest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOB:</td>
<td></td>
</tr>
<tr>
<td>NHS No:</td>
<td></td>
</tr>
</tbody>
</table>

**Review of SBOF use since last visit:**
- Clinical status: stable / exacerbating

**Medication Review:**
- Current symptoms
- Inhaled medication

**Comments on techniques:**

**GP visits to surgery:**
- Smoking History:
  - Current:
  - Quit

**Patients comments:**

**NIRC:**
- SpO2 on air at rest:
- SpO2 on air post exertion:
- ABG /CIG:
- PH PO2 PCO2 HCO3 SaO2

**Review of interventions:**

**Recap:**
- Positioning □
- Paced breathing on walking □
- PUL □
- Paced breathing techniques g □
- Hand-held Fan □
- Inhaled medication use □
- Relaxation techniques □
- Panic / Anxiety management / CBT □
- Pulmonary rehabilitation □
- Palliative symptom management □

**KAD Score:**
- Anxiety ▸
- Depression ▸

**SUDQI Score:**

**Action Plan/Outcome:**

**Review date:**
- Patient information given:
Wirral COPD and Oxygen Service Process Summary'
Acknowledgements

NHS Improvement - Lung would like to thank all national improvement project sites for their hard work and dedication to improve quality and care for people with COPD, and for their contributions to this document.

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- Hamza Jamil, Home Oxygen Service, Department of Health
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- Karen Hatch, NHS Central Lancashire, Regional Oxygen Lead - Cumbria & Lancashire and Greater Manchester
- Judith McElroy, NHS Blackburn with Darwen, Oxygen Service Manager and Home Oxygen Service Lead

For more information please contact: Ore Okosi, National Improvement Lead: ore.okosi@improvement.nhs.uk
References


NHS Improvement

NHS Improvement’s strength and expertise lies in practical service improvement. It has over a decade of experience in clinical patient pathway redesign in cancer, diagnostics, heart, lung and stroke and demonstrates some of the most leading edge improvement work in England which supports improved patient experience and outcomes.

Working closely with the Department of Health, trusts, clinical networks, other health sector partners, professional bodies and charities, over the past year it has tested, implemented, sustained and spread quantifiable improvements with over 250 sites across the country as well as providing an improvement tool to over 800 GP practices.

www.improvement.nhs.uk