

PROPOSAL TO RECOMMENCE CAPILLARY BLOOD GAS SERVICE

Purpose:

This proposal has been established to help document the re-introduction of capillary blood gas testing within primary care to enhance the existing community respiratory service in managing short burst oxygen (SBOT) and ambulatory oxygen provision. The plan considers the estimated costs of development and implementation against the risks and the anticipated clinical benefits and savings to be gained. The totality of business change has been considered, not just the project development cost.

This proposal explains why the forecast effort and time will be worth the expenditure.

Reasons:

Patients with respiratory diseases especially COPD are the highest users of oxygen therapies. There are an estimated 3.7 million people with COPD in the UK, even though only 900,000 are currently diagnosed and receiving treatment and support. It is the fifth highest cause of death within the UK, the second highest cause of emergency hospital admissions and costs the NHS almost £500 million per year. Half of these costs are incurred through hospitalisation, which can be avoidable in some circumstances.

Capillary blood gases (CBG) are an essential tool in assessing and managing patients and are suggested as part of the oxygen assessment process by the BTS and blood gas analysis is currently specified as a provision by the oxygen service within the service level agreement (SLA) but has not been undertaken for over 12 months.

These tests are restricted to secondary care, therefore any patient requiring blood gas analysis (e.g. for Oxygen Therapy assessment or exacerbation management) currently need to be referred to an acute hospital setting.

The technology exists within the oxygen service to provide CBGs within the community clinic at St Peters Centre in the form of an OSMOTECH OPTI CCA blood gas analyzer which would reduce the delays incurred awaiting referral for ABG's in secondary care and would also reduce inconvenient clinic appointments for the patient.

Complementing this provision is the proposal to purchase two hand-held iSTAT machines (weighing less than 1kg) to provide CBG testing at other satellite oxygen clinics and within domiciliary visits which can be catered for by a lone worker fulfilling the Darzi recommendations "moving care closer to patients".

Other factors that may need to be considered are:

- Admission Avoidance – a blood gas can reassure a physician regarding oxygenation and confirm or dismiss respiratory failure. Current volume of unscheduled admission for financial year 07/08 identified = 1530 and the associated cost.
- Inappropriate oxygen prescribing
- Complies with BTS guidance for oxygen and ambulatory assessment
- Increases access to patients who do not attend (DNA) in clinic
- Current spend on community oxygen provision in conjunction is estimated at between £44-47,000 per month. E.g. the month May 09 was £44,214.74 but seasonal variations and bed pressures in acute hospitals will increase this figure.
- 100% of patients referred to the service are correctly assessed for oxygen, but to obtain blood gases on patients meeting protocols (ie Saturations = <92%, variable saturations and suspected hypercapnoea) they need to go into secondary care for arterial sampling which is painful, invasive and with associated risk of radial nerve damage.
- Current spend for long term oxygen (LTOT) patients is within secondary care who are currently reviewing the services they can provide in the future.
- Cost of transport for COPD patients into secondary care but patients needing transport into St Peters can access transport.



Options:

Option	Strength	Weakness
Stay with current system Of ABG's in secondary care	Easy! Known costs Slight risk of litigation if harm to patient to secondary care Speed of available result 2-5 minutes	Fails to meet current or future expectations Traumatic for patients Increased time wait for results – 2-3 weeks Delay in alteration/stopping therapy through waiting for ABG results increases ongoing cost of oxygen provision Untoward incidents potential serious incidents requiring blood gas analysis as part of the investigation are unnecessarily delayed
Perform CBG on i-STAT	Proven pathway (40+ PCOs) True point of care technology <ul style="list-style-type: none"> • Portable • Secure, robust results Enables service flexibility for domiciliary care and satellite clinics Additional marker options e.g. U&Es.	Investment and revenue costs <ul style="list-style-type: none"> • i-STAT instrument • Staff (in place) • Consumables – cost per test dependent on number of test estimated per year. Currently approx £3.20 per test Training Lack of opposition from secondary care
Perform CBG on OSMOTECH system	Proven pathway (40+ PCOs) True point of care technology <ul style="list-style-type: none"> • Less Portable • Secure, robust results Enables service flexibility within St Peters clinic Additional marker options e.g. U&Es. Dependent on system	Investment and revenue costs <ul style="list-style-type: none"> • Analyzer already in place requiring service contract of £600 to re-establish usage • Staff (in place) • Consumables – cost dependent as above. Currently approx £1.40 per test Training Lack of opposition from secondary care
Outreach service from secondary care to other centres - Burnley and Accrington	Support from and integration with secondary care. No SLA/contract	Will not meet all objectives Inflexible Cost to Secondary care not commissioned so at risk ABG's traumatic for patients Not possible for domiciliary patients Long term contract



Benefits:

Reduce levels of inappropriate prescribing for patients on SBOT leading to:

- More controlled patients – fewer unnecessary call outs and exacerbations
- Safer assessment – blood gases are classed as a Gold Standard test for oxygen prescribing.
- More effective spend on oxygen
- Less inappropriate oxygen prescribing
- Blood gases are a more accurate assessment (Gold standard) compared to saturations alone so are trusted more by medical professionals
- Should the service accommodate LTOT assessments in the future
- There is a clinical team leader in place already familiar with the equipment and highly skilled at taking and training staff in Capillary blood gas sampling and interpretation
- A team in place who are enthusiastic and willing to extend current skills
- Quality of care/patient experience is increased as primary care is more convenient and the test is less invasive

Risks:

Possible risks to be considered could include:

- Slow implementation for patients due to training requirements
 - Taking samples
 - Interpretation
 - Clinical support
- Infection control
 - Patients
 - Staff
- New service identifies/creates additional demand.

Equipment

Capital

Cost:

i-Stat Analyzers x 1 package (includes printer, rechargeable battery, downloader/recharger, electronic simulator and training)	£8,356.00
Additional i-STAT handset	£6130.00
Rechargeable battery for 22 nd handset	£134.00

Revenue

OSMOTEC OTI analyzer yearly contract support quote	£600.00
Osmotech cassettes	£ tba
G3+ Cartridges (Box of 25) @ £110.00 approx pr box 25 Total pr year approx	£750.00
Level 1 and 3 Control @ £13.00 each	£130.00
Sundries – glass tubes, sharps boxes, nasal cannulas etc	£250.00

Training

Training for the use of both machines will be provided by the medical instrument companies and for taking the capillary blood gases will be undertaken in-house by the clinical lead.



Timescales:

Gantt table to show when completion of CBG service would be available after funding and protocols have been approved.

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Contract support for OPTI	→															
Training on OPTI And ISTAT			→													
Training on CBG sampling technique			→													
Undertaking observed sampling				→												
Independent sampling by respiratory nurses								→								
Adjustments to assessment paperwork for sampling		→														
Informing other Health Professionals in change of provision												→				

Case Examples of when CBG's could have been used

Case A

Mr. A was visited at home - previous arterial blood gases showed he required oxygen therapy. Mr. A was identified as having risky behaviour with the oxygen (e.g. smoking whilst on the oxygen, leaving the oxygen on, using against medical advice) which was putting other people at risk. On arrival his saturations were 94% indicating this therapy was no longer required, however performing a CBG with the portable ISTAT would have been conclusive evidence to support the removal of this therapy.

Case B

Mrs B was seen in St Peters clinic for an ambulatory assessment and on arrival was found to have saturations of between 97-93% however only 2 weeks previously have been for an ABG at the hospital and met the criteria for LTOT based on ABG's. She has an exercise test which gave was further proof she remained well and was advised to step down to short burst oxygen. Mrs B now needs to be referred back to secondary care for a repeat blood gas on air. If CBG tests were accessible in the St. Peters clinic this could have been undertaken on this assessment, saving cost and inconvenience to the patient and health care economy. This delay also incurs a cost in the form of oxygen prescribing as the withdrawal of oxygen therapy is delayed.



Calculated Cost Saving

Based on 70 acute COPD admissions if we could avoid only 2 per month during the course of oxygen assessments if purchasing two i-STAT machines.

Your current costs for unscheduled COPD admissions are		£ 1,832,472.04
Annual costs of Community CBG testing		£ 19,800.00
Net saving after		
	3 months	-£779.73
	6 month	£16,440.53
	12 months	£50,881.06
<p><i>This calculator is based on publically available National PbR tariff costs. It is intended for illustration and discussion purposes only.</i></p>		

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