‘Audit of process and outcome in cases of acute exacerbation of COPD admitted to Hospital’

A pilot study commissioned by The Academy of Royal Colleges and managed by the Clinical Effectiveness Evaluation Unit of the Royal College of Physicians supported by the Audit Subcommittee of the Standards of Care committee of the British Thoracic Society

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Background / Introduction

Respiratory disease accounts for about 25% of acute medical hospital admissions (Pearson 1994) and over half of these are due to chronic obstructive pulmonary disease. This translates into about 680 admissions per year for an average district hospital, this being over 50% more than for asthma (Anderson 1994). COPD accounts for 6.4% of all male and 3.9% of female deaths (OPCS 1992). The mortality and morbidity resulting from acute exacerbations of COPD meriting hospital admission remains high (BTS 1997). There are additional huge socio-economic effects produced by the dependency and continuous medical and social support required for many of these patients. During 1997 the British Thoracic Society conducted an audit of the process and outcomes of hospital care of 1400 admissions in 38 different hospitals across Britain. The analysis of these collected data suggests great variation in standards of care and outcomes between hospitals and confirms high mortality and readmission rates for these patients. For example the mean length of stay varied from 4 to 8 days and mortality from 3 to 24% between centres. A number of factors were identified that helped predict outcome and which could be used to help account for confounding factors when comparing one centre with another. Nevertheless the majority of the variability in outcome and process was not accounted for by the factors identified in that study.

The British Thoracic Society published national guidelines on the management of COPD in 1997. Currently, the Royal College of Physicians/BTS standards of care committee is in the process of compiling an audit tool to prospectively monitor standards of care of COPD patients across hospital trusts within the UK.

This current (2001) pilot study aimed to assess the practicality of using this tool in a national audit process and to reassess a number of factors that may affect the clinical process and outcome that were not included in the 1997 national audit. There is a wealth of data yet to be assessed and this report concentrates on feeding back clinical data to individual participating hospital, data that may be used to benchmark performance against national standards (BTS Guidelines) and hospitals of a similar size and type within England and Wales.

Once all the data analyses are complete, a more detailed report including the development process of the short form audit tool used, the pre-pilot study undertaken, the full methodology and hypotheses generated from further statistical analyses will be available from mid January at the RCP web site address:

www.rcplondon.ac.uk/college/ceeu/ceeu_copd_home.htm

The lessons learned from this pilot will be summarised here and plans for the national audit will be regularly updated. You are encouraged to feedback your comments both about this report (which is in one sense a pilot of the report format in the national audit) and on the content of the website.

Words of caution.

This was, after all, a pilot study, and not a national audit. We should therefore be wary of trying to read too much into the data that have emerged. One purpose of this audit is to try and identify which data items are weak and which are robust. A lot of data collected in this pilot was to do with feasibility, burden, case completeness, bias, reliability, identifying other collectable data items, omissions, doubts about data quality, data entry, procedures for checking accuracy and so forth. Many of these more qualitative aspects will be summarised on the RCP web site.

From the statistical perspective the main concern is that the results of certain larger pilot hospitals could have a disproportionate effect on the overall results. This potential for bias comes about because relative to the intended national audit, this pilot has a small number of hospitals taking part, and some sites have up to six times the number of patients than other sites. This effect would not be as likely to occur in a larger national audit.

Method

This pilot was conducted in 30 hospitals in England and Wales, following a joint approach to NHS Trust chief executives and respiratory physicians. It was conducted through voluntary participation and project ownership was encouraged at all stages. An 8-week prospective data collection period was set (with sites starting in 2 waves) with patient outcomes measured at 90 days after admission date. All consecutive patient admissions with a diagnosis of COPD on admission were to be included.

Key endpoints:

1. Number (%) of invited hospitals participating
2. Accuracy of case ascertainment
3. Accuracy/reliability of data collection
4. Description of methods of case ascertainment and data collection used in participating centres.
5. Description of practical difficulties encountered by centres in data collection.
6. Confirmation of predictors of mortality as found in the 1997 BTS audit.
7. Identification of further important predictors of mortality.
8. Comparison of findings between hospital groups (Teaching, large DGH, small DGH).
9. Variation in findings between individual hospitals of the same group.

Information regarding endpoints 2, 3, 4, 5, and 7 will be available at the website.

Site Selection

To further the objectives of this project it was decided that 30 sites be involved for this project, involving a mix of 10 Teaching Hospitals, 10 Large District General Hospitals, and 10 Smaller District general Hospitals.

All hospitals in England and Wales with at least 1 full time respiratory consultant were categorised by size / function by reference to the trust classification used by NHS for assessing performance, into teaching, large, or small. The grouping as to large and small derived from using the NHS/ONS cluster definitions for “very large” trusts.

From the pool of teaching hospitals 10 were selected by random number generation, whilst the remaining hospitals were further subdivided within 5 geographical regions, with 2 large and 2 small being selected from each. Hospitals within each subgroup were allocated a number at random and this number determined the order in which hospitals were invited to take part in the audit.

Following initial approaches to NHS trust Chief Executives and Respiratory Physicians, sites either accepted outright or agreed to participate after further details regarding the process. Otherwise, they declined to participate for practical reasons. Of the 30 sites approached initially 22 (73%) accepted:-

Site type	Approached	Accepted	Declined
Teaching	10	6	4
Large DGH	10	8	2
Small DGH	10	8	2
Total	30	22 (73%)	8 (27%)

Where sites declined to participate, the next site listed by random number generation, was approached, and where these also were unable to participate, the next was approached and so on. In total 41 sites were invited to participate with 26 (63%) agreeing. An extra 4 sites came on board, 3 from trusts which already had a site participating, and 1 by word of mouth within the same city.

Teaching Hospitals (11)	**Large DGH (9)**	**Small DGH (10)**
	London & East	**London & East**
	Ipswich Hospital	Bromley Hospital
Bristol Royal Infirmary	Whipps Cross Hospital	**NWest, Northern & Yorkshire**
Churchill Hospital Oxford	**NWest, Northern & Yorkshire**	Dewsbury & District Hospital
City Hospital Nottingham‡	Sunderland Royal Hospital	Pindersfield Hospital
Freeman Hospital Newcastle	**SEast, SWest, & Islands**	*Pontefract General Infirmary*
Guys & St Thomas' Hospital	Royal Cornwall Hospital	**SEast, SWest, & Islands**
John Radcliffe Hospital Oxford	**Trent & West Midlands**	Milton Keynes General
Llandough Hospital‡	City Hospital Birmingham	**Trent & West Midlands**
Royal London Hospital	County Hospital Lincoln	Barnsley District General
Southampton General Hospital	**Wales**	Chesterfield & N Derbyshire
University College London	Glan Clwyd Hospital	**Wales**
University Hospital Nottingham	University Hospital of Wales*	Bronglais Hospital
	Withybush General Hospital	Prince Philip Hospital
		West Wales General Hospital

The additional 4 volunteer sites are shown in italics

‡ Not teaching hospitals but have significant Respiratory Education Positions.
* Teaching hospital but University posts are at Llandough.
(Sites in brackets have not yet returned full data.)

Data entry and collation

Data were to have been returned electronically but some audit departments returned paper copy only. There were inevitably some data entry errors and many are described here. Some other problems and ideas on how to keep data collection errors to a minimum in future auditing will be available from the RCP website in due course.

Duplicate cases

Of the 1380 admissions submitted by the 30 sites, 14 (1.0 %) were duplicate records from 10 sites. These duplicates were picked up from either the date of birth or from the hospital number, and having the same admission date.

Blank data fields

These represent "no answer" since the auditor left the data field blank. The table below lists the prevalence of blank data fields by data item and comments on whether this was a problem specific only to a few sites.

Data item	% (N) of 1380 admissions left BLANK	Site variation (30 sites)
ADMISSION		
Date of birth	0% (1)	1 site
Admission date	0% (0)	
Gender	0.5% (6)	4 sites
Admission time	10% (135)	24 sites
Postcode (first part)	7% (103)	12 sites, 72/101 from (BAR), 13 (PON)
Performance status	1% (13)	7 sites
Smoking habit	2% (21)	10 sites
Peripheral Oedema	6% (79)	From 19 sites, 38/76 from (PIN, WWG, BAR, BSL)
Chest X-ray appearance	1% (12)	6 sites
EARLY MANAGEMENT		
Systemic corticosteroids	3% (37)	18 sites
Oxygen	4% (60)	16 sites
Ventilatory support	5% (72)	18 sites
Arterial blood gases repeated within 12 hours if pH <7.35	4% (55)	18 sites
LATE MANAGEMENT		
LTOT screening PO2>7.3 or SaO2>92% on air noted at some time	9% (119)	23 sites, 44/115 from (BAR, UHN, WXH)
Already has concentrator	22% (304)	25 sites, 115/294 from (SRH, BAR)*
LTOT considered if PO2<7.2 on air	20% (275)	27 sites, 103/268 from (BAR, BSL, UHN)
Non-smoker status	8% (106)	24 sites
Smoking cessation advice	10% (132)	26 sites, 55/124 from (BAR, MKG, CHB)
Inhaler at discharge	12% (162)	26 sites
Technique tested & documented	10% (136)	27 sites, 60/132 from (BAR, CHB, PON, UHN)
OP respiratory review arranged	9% (122)	24 sites
GP discharge letter present	7% (91)	23 sites
Proforma completion date	7% (96)	19 sites, 40/95 from (BSL)

* often not routinely recorded in notes

Outlier problems

Data item	Outlier problems	Outliers
ADMISSION		
Date of birth	5 cases in " 2001", 1 cases in "2027"	4 sites
Admission date	1 case in 1903, 1 in 1929, 1 in 2000, 2 Jan 2001; Otherwise 2/2/01 to 6/11/01	5 sites
Performance status	2 cases where 2 mutually exclusive boxes were both chosen	2 sites
Serum albumin	2.8, 10, 11, 360(2), 380(2), 390, 410(2), 420, 430; Otherwise range 21-50	5 sites
Blood Urea	304, 509; Otherwise range 1.1-67	2 sites
PH	1.40, 2.40; Otherwise range 6.76 – 7.72	2 sites
Bic	52, 2.00-6.10 (29 cases), 9.0, 250, 2901; Otherwise range 13.0-56.5 The range 2.0-6.10 was used by 7 sites, but mainly (21 cases by 2 sites ABE, FRE, though for both of these most of their cases were within the 13.0-56.5 range.	9 sites
PCO2	Two scales: Ranges 2.10-24.0: 30-134. 8 possible outliers from 3 sites	27:3 split
PO2	Two scales: Ranges 2.93-38.80: 40.50-221.60 7 possible outliers from 5 sites	27:3 split same as for PCO2
EARLY MANAGEMENT		
Oxygen	1 case: "yes" and "no" both chosen	1 site
% Flow rate	Two scales: Ranges percentages, and litres Predominantly a 28:2 split but 18 sites did use both scales Outlier values: 16 (2), 2.1 lit, 2.4 lit (4), 20, 22 (2), 24.35, 26 (6), 29 (3), 42, 44,	28:2 split Outliers: 7 sites
FEV1	0.07(2), 4.70, 5.50, 8.85, 10.40, 11.90, 45, 57, 64, 71; Otherwise 0.16-3.15	8 sites
% of Predicted FEV	8, 2.32, 3.02, 5.4, 101, 108, 111 %; Otherwise range 11-89% 1 site coded as proportion rather than percentage	5 sites
Ventilatory support	4 cases "doxapram" and "non-invasive" both chosen 1 case "invasive" and "non-invasive" both chosen 1 case "invasive", "doxapram" and "non-invasive" both chosen	5 sites*
Arterial blood gases repeated within 12 hours if pH <7.35	4 cases "yes" and "not applicable" both chosen 4 cases "no" and "not applicable" both chosen	3 sites 4 sites
LATE MANAGEMENT		
LTOT screening PO2>7.3 or SaO2>92%	1 case: "yes" and "no" both chosen	1 site
LTOT considered if PO2<7.3 on air	5 cases "yes" and "not applicable" both chosen 52 cases "no" and "not applicable" both chosen	5 sites 14 sites, 28 from 2 sites
Smoking cessation advice given / documented	1 cases "no" and "not applicable" both chosen	1 site
Inhaler technique tested & documented	2 case "no" and "not applicable" both chosen	2 sites
GP discharge letter present	1 case: "yes" and "no" both chosen	1 site
GP seen patient since discharge	1 case: "yes" and "no" both chosen	1 site
Died from COPD or complications of COPD	4 cases: "Died from COPD…" and "Died from other causes" both chosen.	4 sites**

*these are possible

** could be if had both COPD and heart disease for example or pneumonia and COPD i.e. if possible. didn't have COPD wouldn't have died of these conditions

Inconsistency Checks:

- Date sequences out of sequence: Date of birth and admission (6 cases), admission and discharge (8 cases), admission and death (10 cases).

- Blood gases stated as "not recorded" yet 3 cases with blood gases values were given. Recoded as "value taken". Similarly, 2 cases for FEV1. In 10 cases blood gases were stated as recorded but none of the gases had values. Likewise with FEV1 for 54 cases.

- Chest x-ray appearance. Of 284 cases in which it was stated that this was "not taken/No comment made" there were 61 cases (21%) for which either the SHO (18), registrar (16), Respiratory consultant (5), or Non-respiratory consultant (22) is said to have made the Chest X-ray comment. This was so for 10 sites, 48/61 from 3 sites.

- Smoking habit on admission and (non) smoking status during late management:- broadly similar results.

- Arterial Blood gases repeated within 12 hours if pH<7.35 was cross-tabulated against pH value on admission. Of 244 cases where repeat arterial blood gases had been taken, 76 cases (26 sites) had a pH of >7.35 and were presumably done for other reasons. There were also 6 instances of repeat gases for which there was no admission pH recorded. For analysis all those cases with an initial pH of >7.35, or with pH missing, were recoded as "non-applicable".

- Perhaps a similar difficulty has occurred with the coding of LTOT screening PO2>7.3 kPa or SaO2>92% on air noted at some time within admission. However we only have the initial PO2 value, which may or may not have been on air, and we don't have any SaO2 values. Hence no adjustment can be made. Likewise the variable "If PO2 <7.3 on air has the patient been considered for LTOT".

These last two issues need careful thought regarding revision for a national audit. LTOT and oxygen therapy is poorly described in notes by doctors and nurses and auditors have to search around in the notes before being able to make these judgements

Clinical data summary: Process of care

Details of patient at the time of admission

Number of admissions,

After exclusion of duplicate cases there were a total of 1366 admissions, 495 from 11 teaching hospitals, 394 from 9 large District general hospitals, and 477 from 10 small District general hospitals. Most (81%) admissions were during March & April 2001:

Month of admission	Teaching	Large DGH	Small DGH
Feb 2001	78 (16%)	25 (6%)	32 (7%)
Mar 2001	201 (41%)	233 (59%)	243 (51%)
April 2001	151 (31%)	132 (34%)	141 (30%)
May 2001	42 (8%)	4 (1%)	39 (8%)
June 2001	2	-	15 (3%)
July 2001	-	-	5 (1%)
Aug 2001	-	-	-
Sep 2001	1		
Oct 2001	14 (3)		
Nov 2001	3		
Not known	3		2
Total	495 (100%)	394 (100%)	477 (100%)

Type of Hospital	Number of sites	Admissions per site
Teaching (n=495)	11	19, 25, 29, 33, 40, 42, 46, 47, 63, 67, 84
Large DGH (n=394)	9	19, 25, 26, 31, 45, 47, 50, 52, 99
Small DGH (n=477)	10	14, 22, 31, 32, 35, 35, 61, 77, 80, 90

Your site: 47 admissions.

Gender

- *The proportion of males to females and the age range are compatible with previous epidemiological surveys.*

	GENDER		
	NK	F	M
Teaching (n=495)	-	210 (42%)	285 (58%)
Large DGH (n=394)	-	153 (39%)	241 (61%)
Small DGH (n=477)	6 (1%)	218 (46%)	253 (53%)
Your site	0	25 (53%)	22 (47%)

Age

	AGE IN YEARS AT ADMISSION					
	<65	65-74	75-84	85+	NK	Mean (SD)
Teaching (n=495)	90 (18%)	206 (42%)	164 (33%)	32 (7%)	3	72.3 (9.0)
Large DGH (n=394)	94 (24%)	147 (37%)	118 (30%)	29 (7%)	6 (2%)	71.1 (10.3)
Small DGH (n=477)	92 (19%)	191 (40%)	162 (34%)	29 (6%)	3 (1%)	72.3 (8.8)
Your site	3 (6%)	19 (40%)	22 (47%)	3 (6%)	0	75 (9)

Admission Procedure

Performance status

- *Performance status was shown in the 1997 audit to be the most important predictor of death measured in that survey. Unfortunately, unlike in lung cancer cases, it is often not formally recorded in COPD admissions. It would seem to be good practice if this were to change.*

	PERFORMANCE STATUS					
	Unknown	Normal activity	Strenuous activity limited	Limited but self care	Limited self care	Bed or chair bound no self care
Teaching (n=495)	48 (10%)	57 (12%)	141 (29%)	136 (28%)	88 (18%)	25 (5%)
Large DGH (n=394)	48 (12%)	47 (12%)	101 (26%)	123 (31%)	64 (16%)	11 (3%)
Small DGH (n=477)	64 (13%)	43 (9%)	118 (25%)	111 (23%)	124 (26%)	17 (4%)
Your site	3 (6%)	5 (11%)	7 (15%)	18 (38%)	11 (23%)	3 (6%)

Smoking habit

- *Smoking is the major causes of COPD within the UK. Smoking cessation is one of the few interventions demonstrated to increase life expectancy. Accurate documentation of smoking status and appropriate intervention in those still smoking is best practice.*

	SMOKING HABIT				
	Current smoker	Ex-smoker >3m	Lifelong non-smoker	Not recorded	No answer
Teaching (n=495)	208 (42%)	248 (50%)	16 (3%)	18 (4%)	5 (1%)
Large DGH (n=394)	133 (34%)	222 (56%)	13 (3%)	20 (5%)	6 (2%)
Small DGH (n=477)	138 (29%)	254 (53%)	43 (9%)	32 (7%)	10 (2%)
Your site	15 (32%)	25 (53%)	0 (0%)	6 (13%)	1 (2%)

Peripheral oedema (noted at any time during admission)

- *Presence of peripheral oedema was an important predictor of death in the 1997 survey. Accurate recording on admission or at sometime during admission is good practice.*

	PERIPHERAL OEDEMA		
	Yes	No	No answer
Teaching (n=495)	130 (26%)	340 (69%)	25 (5%)
Large DGH (n=394)	124 (32%)	264 (67%)	6 (2%)
Small DGH (n=477)	115 (24%)	313 (66%)	49 (10%)
Your site	22 (47%)	24 (51%)	1 (2%)

Serum albumin and blood urea

- *Serum albumin and blood urea were not recorded in the 1997 audit but have been found to predict outcome in acute COPD in previous studies and are viewed as prognostic markers in other medical conditions too. They were therefore included in this audit to consider if they explained any more of the variability in outcome observed between individuals and between centres. This is important in both allowing clinicians to identify patients most at risk of death and secondly in accounting for confounding factors in patient populations when making comparisons between centres.*

	SERUM ALBUMIN			BLOOD UREA		
	Valid value	Median (IQR)	Below 34 g/l	Valid value	Median (IQR)	Above 7.1 mmol/l
Teaching (n=495)	327 (66%)	37 (34-40)	77 (24%)	461 (93%)	6.1 (4.7-8.5)	166 (36%)
Large DGH (n=394)	263 (67%)	37 (33-40)	77 (29%)	387 (98%)	6.1 (4.5-8.6)	138 (36%)
Small DGH (n=477)	193 (40%)	37 (34-40)	47 (24%)	435 (91%)	6.4 (4.7-8.9)	175 (40%)
Your site	40 (85%)	Med: 41	2 (5%)	45 (96%)	Med: 6.5	16 (36%)

Serum albumin was less routinely recorded than blood urea particularly in the smaller hospitals: The hospital variation in recording these values was:

Type of Hospital	% cases Serum Albumin recorded, by site
Teaching	47, 49, 55, 55, 72, 78, 78, 81, 82, 84, 88
Large DGH	41, 54, 60, 67, 68, 74, 85, 92, 96
Small DGH	16, 21, 30, 37, 41, 49, 50, 53, 83, 91

Your site: 85% of cases

For Blood urea:

Type of Hospital	% Blood Urea recorded, by site
Teaching	74, 83, 90, 92, 94, 96, 97, 97, 98, 100, 100
Large DGH	92, 96, 96, 99, 100,100,100,100, 100
Small DGH	80, 86, 87, 88, 88, 89, 90, 96, 99, 100

Your site: 96% of cases

Arterial Blood Gases on Admission

- *Arterial pH was an important predictor of outcome in the 1997audit and has been shown to predict outcome in several of studies of acute respiratory failure in COPD. The BTS guidelines recommend it be measured at admission and that patients with a pH of less than 7.26 be considered for ventilatory support. Patients with type II respiratory failure require controlled oxygen therapy prescribing and documenting in the case notes.*

	PH			
	Valid value	Median(IQR)	<7.26	7.26-7.34
Teaching (n=495)	434 (88%)	7.40 (7.36-7.44)	36 (8%)	55 (13%)
Large DGH (n=394)	325 (82%)	7.40 (7.35-7.43)	21 (6%)	58 (18%)
Small DGH (n=477)	386 (81%)	7.40 (7.34-7.44)	30 (8%)	71 (18%)
Your site	44 (94%)	Med: 7.40	2 (5%)	6 (14%)

	BIC			
	Valid value	Median (IQR)	<23 mmol/l	>30 mmol/l
Teaching (n=495)	405 (82%)	27 (24-30)	49 (12%)	88 (22%)
Large DGH (n=394)	312 (79%)	27 (24-32)	35 (11%)	90 (29%)
Small DGH (n=477)	356 (75%)	26 (24-30)	57 (16%)	84 (24%)
Your site	43 (91%)	Med: 28	2 (5%)	17 (40%)

	PCO2 KPA			
	Valid value	Median(IQR)	<=6.0	>6.0
Teaching (n=495)	430 (87%)	5.8 (5.0-6.9)	244 (57%)	186 (43%)
Large DGH (n=394)	327 (83%)	5.9 (5.1-7.4)	179 (55%)	148 (45%)
Small DGH (n=477)	383 (80%)	5.7 (4.9-7.0)	220 (57%)	163 (43%)
Your site	43 (91%)	Med: 6.1	20 (47%)	23 (53%)

Conversion factor for scales was used (mmHg to kPa)

	PO2 KPA			
	Valid value	Median (IQR)	<7.3	7.3-8.0
Teaching (n=495)	431 (87%)	9.0 (7.7-10.9)	82 (19%)	48 (11%)
Large DGH (n=394)	329 (84%)	9.2 (7.9-12.8)	53 (16%)	43 (11%)
Small DGH (n=477)	382 (80%)	9.6 (7.8-12.0)	71 (19%)	40 (10%)
Your site	44 (94%)	Med: 9.2	8 (18%)	7 (16%)

Conversion factor for scales was used (mmHg to kPa)

Site variation in blood gases being recorded:

Type of Hospital	% cases Blood gases done, by site
Teaching	74, 83, 85, 85, 88, 88, 89, 90, 91, 94, 97
Large DGH	73, 74, 78, 83, 84, 84, 89, 94, 94
Small DGH	57, 77, 79, 81, 82, 83, 87, 93, 96, 97

Your site: 94%

Chest X-Ray appearance

- *BTS guidelines recommend that a chest radiograph be taken on admission in patients with acute COPD. It is best practice for the most senior doctor responsible for the care of the patient (normally a consultant) to see the radiograph and for reasons of clinical governance that this report be documented in the case-notes. It has been reported in other studies that the presence of either infiltrates consistent with consolidation or changes suggestive of cancer both imply a significantly worse prognosis during an acute admission with COPD.*

	CHEST XRAY APPEARANCE					
	No abnormality	Changes cons with COPD bronchitis emphysema	Suspected Cancer or definite Cancer	Other abnormality	Not taken/ no comment made	No answer
Teaching (n=495)	70 (14%)	166 (34%)	17 (3%)	162 (33%)	107 (22%)	5
Large DGH (n=394)	42 (11%)	169 (43%)	8 (2%)	135 (34%)	71 (18%)	1
Small DGH (n=477)	64 (13%)	150 (31%)	11 (2%)	158 (33%)	101 (21%)	6
Your site	4 (9%)	29 (62%)	1 (2%)	6 (13%)	6 (13%)	1

Multiple answers were possible.

	CHEST XRAY APPEARANCE WHO MADE COMMENT				
	Stated	SHO	Registrar	Respiratory consultant	Non-respiratory consultant
Teaching (n=495)	366	175 (48%)	111 (30%)	25 (7%)	57 (16%)
Large DGH (n=394)	324	145 (45%)	60 (19%)	30 (9%)	91 (28%)
Small DGH (n=477)	386	203 (53%)	93 (24%)	17 (4%)	72 (19%)
Your site	42	31 (74%)	8 (19%)	1 (2%)	2 (5%)

Multiple answers were possible.

Early Management in hospital

Systemic corticosteroids (as an inpatient)

- *BTS guidelines recommend that systemic steroids be considered in acute COPD admissions. There is now some evidence that steroid use may shorten time of admission and improve recovery time.*

	SYSTEMIC CORTICOSTEROIDS		
	Yes	No	No answer
Teaching (n=495)	424 (86%)	53 (11%)	18 (4%)
Large DGH (n=394)	333 (85%)	56 (14%)	5 (1%)
Small DGH (n=477)	409 (86%)	54 (11%)	14 (3%)
Your site	37 (79%)	9 (19%)	1 (2%)

(Controlled) Oxygen (as an inpatient)

- *BTS guidelines recommend that controlled oxygen be prescribed initially for patients in respiratory failure. This is particularly important for those with type II failure.*

	OXYGEN GIVEN			FLOW RATE		
	No answer	No	Yes	Done	Controlled O2*	Uncontrolled O2
Teaching (n=495)	18	50	427 (86%)	383 (90%)	335 (87%)	48 (13%)
Large DGH (n=394)	12	43	339 (86%)	234 (69%)	210 (90%)	24 (10%)
Small DGH (n=477)	29	79	369 (77%)	319 (86%)	282 (88%)	37 (12%)
Your site	6	3	38 (81%)	34 (89%)	27 (79%)	7 (21%)

** <=28% or <= 4 litres.*

Selected if PaCO2>6KpA:

	OXYGEN GIVEN			FLOW RATE		
	No answer	No	Yes	Done	Controlled O2*	Uncontrolled O2
Teaching H (n=186)	4	5	177 (95%)	162 (92%)	136 (84%)	26 (16%)
Large DGH (n=148)	5	2	141 (95%)	108 (77%)	96 (89%)	12 (11%)
Small DGH (n=163)	9	10	144 (88%)	126 (88%)	109 (87%)	17 (13%)
Your site	2	1	20 (87%)	17 (85%)	14 (82%)	3 (18%)

**<=28% or <= 4 litres*

Most recent recorded spirometry (in last 5 years)

- *BTS guidelines use the FEV1 as the main diagnostic test to confirm clinically suspected COPD. It is also used in the percent predicted format to classify the severity of the condition. In this study FEV1 recorded at any time within the previous five years, during the admission period or in the subsequent 90 days from the admission date was eligible to be included. In the 1997 audit almost half the cases of Physician made diagnoses of COPD did not have a recorded FEV1 measurement. Five percent of those recorded as a percentage of the mean predicted value were in the normal range.*

FEV1

	MOST RECENT SPIROMETRY IN LAST 5 YEARS			
	FEV1 Value*		FEV1: Females	FEV1: Males
	F	M	Median (IQR)	Median (IQR)
Teaching (n=495)	106 (50%)	152 (53%)	0.69 (0.55-0.90)	0.99 (0.70-1.30)
Large DGH (n=394)	71 (46%)	125 (52%)	0.75 (0.58-0.91)	0.87 (0.69-1.25)
Small DGH (n=477)	80 (37%)	82 (32%)	0.82 (0.62-1.10)	1.13 (0.72-1.50)
Your site	2 (8%)	3 (14%)	Med: 1.0	Med: .7

**percentages of females and males separately*

Thus FEV1 values were not found recorded for about half of admissions from teaching hospitals and larger DGH's, and for about two-thirds from small DGH's.

Site variation:

Type of Hospital	% cases with FEV1 values, per site
Teaching	17, 32, 36, 41, 49, 53, 55, 64, 65, 79, 86
Large DGH	4, 11, 25, 47, 59, 68, 74, 76, 76
Small DGH	0, 9, 18, 23, 25, 29, 38, 43, 44, 61

Your site: 11% of cases

Predicted FEV1

	MOST RECENT SPIROMETRY IN LAST 5 YEARS			
	%PRED Value*		%PRED: Females	%PRED: Males
	F	M	Median (IQR)	Median (IQR)
Teaching (n=495)	67 (32%)	91 (32%)	37 (30-50)	40 (27-53)
Large DGH (n=394)	53 (35%)	89 (37%)	38 (30-49)	30 (23-43)
Small DGH (n=477)	63 (29%)	64 (25%)	45 (31-60)	44 (33-52)
Your site	2 (8%)	3 (14%)	Med: 38	Med: 48

**percentages of females and males separately*

Did patient receive ventilatory support?

- *BTS guidelines recommend that ventilatory support be considered in those with a pH of less than 7.26. Doxapram, non-invasive and invasive ventilation have all been shown to improve outcome in these patients.*

	VENTILATORY SUPPORT				
	Not indicated	No answer	Invasive	Non-invasive	Doxapram
Teaching (n=495)	434	23	9	36	4
Large DGH (n=394)	346	13	10	22	5
Small DGH (n=477)	420	36	10	7	6
Your site	42	3	0	1	2

PH<7.26

	VENTILATORY SUPPORT				
	Not indicated	No answer	Invasive	Non-invasive	Doxapram
Teaching H (n=36)	12	5	6	13	2
Large DGH (n=20)	7	3	3	6	3
Small DGH (n=30)	15	6	5	2	2
Your site	1	0	0	1	1

The options on the proforma for this question were 'Invasive', 'Non-invasive', 'Doxapram' and 'Not indicated'. Multiple answers are possible

Arterial Blood Gases repeated within 12 hours if pH<7.35

- *BTS recommends that in acidotic patients arterial blood gases should be repeated to ensure that the patient is progressing. Acidosis is a predictor of death.*

	REPEAT BLOOD GASES WITHIN 12 HOURS IF PH<7.35				
	No answer	Not applicable	Applicable	Yes	No
Teaching (n=495)	3	406	86 (17%)	59 (69%)	27
Large DGH (n=394)	5	316	73 (19%)	45 (62%)	28
Small DGH (n=477)	5	390	82 (17%)	53 (65%)	29
Your site	0	39	8 (17%)	4 (50%)	4

Table after adjustment: cases for whom repeat blood gases were said to have been done, when the initial pH was >7.35, were reclassified as being "not applicable". Cases for whom repeat blood gases were said to have been done, when the initial pH value was given as zero, were also recoded as "not applicable".

Late Management procedure

LTOT screening PO2>7.3 kPa or SaO2>92% on air noted at sometime in admission

- *Prescription of LTOT for those with severe chronic hypoxia especially in the presence of cor pulmonale is one of the few interventions that may improve life expectancy. Whilst it should not normally be prescribed for patients that are acutely unwell it should be considered as a future intervention in all patients admitted with severe hypoxia. Patients admitted with severe hypoxia should have a satisfactory PaO2 or SaO2 documented prior to discharge or have documented plans to assess for LTOT at a later stage when stable. Documentation of a PaO2 >7.3kPa on air during the acute admission excludes further immediate need to consider LTOT in most cases. Patients already receiving LTOT are likewise excluded from the requirement for assessment prior to discharge.*

LTOT screening PO2>7.3 kPa or SaO2>92% on air noted at sometime within admission			
	Yes	No	No answer
Teaching (n=495)	290 (58%)	167	38
Large DGH (n=394)	165 (42%)	202	27
Small DGH (n=477)	195 (41%)	228	54
Your site	7 (15%)	27	13

Already has concentrator?

	ALREADY HAS CONCENTRATOR		
	Yes	No	No answer
Teaching (n=495)	85 (17%)	300	110
Large DGH (n=394)	61 (15%)	244	89
Small DGH (n=477)	62 (13%)	314	101
Your site	17 (36%)	22	8

If PO2 <7.3 kPa on air has patient been considered for LTOT

	IF PO2 <7.3 ON AIR HAS PATIENT BEEN CONSIDERED FOR LTOT				
	No Answer	Not applicable	Applicable	Yes	No
Teaching (n=495)	95	303	97 (20%)	56 (58%)	41
Large DGH (n=394)	51	226	117 (30%)	42 (36%)	75
Small DGH (n=477)	128	216	133 (28%)	34 (26%)	99
Your site	10	28	9 (19%)	6 (67%)	3

Selected Patients: Do not have concentrator and have PaO2<7.3 on admission:

	IF PO2 <7.3 ON AIR HAS PATIENT BEEN CONSIDERED FOR LTOT				
	No Answer	Not applicable	Applicable	Yes	No
Teaching H (n=50)	2	15	33 (66%)	18 (55%)	15
Large DGH (n=28)	1	12	15 (54%)	7 (47%)	8
Small DGH (n=46)	6	13	27 (59%)	9 (33%)	18
Your site	0	2	2 (50%)	1 (50%)	1

Non-smoker or has stopped > 3 months

	NON-SMOKER OR STOPPED >3M		
	Yes	No	No answer
Teaching (n=495)	256	204 (41%)	35
Large DGH (n=394)	238	134 (34%)	22
Small DGH (n=477)	290	138 (29%)	49
Your site	26	16 (34%)	5

Smoking cessation advice given and documented

- *As referred to above intervening to assist smokers to give up is the most cost effective intervention in COPD. For clinical governance reasons this intervention should be formally recorded in the case notes.*

	SMOKING CESSATION ADVICE GIVEN & DOCUMENTED				
	No answer	Not applicable	Applicable	Yes	No
Teaching (n=495)	37	263	195 (39%)	57 (29%)	138
Large DGH (n=394)	28	226	140 (36%)	36 (26%)	104
Small DGH (n=477)	67	265	145 (30%)	25 (17%)	120
Your site	4	28	15 (32%)	3 (20%)	12

Inhaler at discharge / Inhaler technique tested and documented

- *It is recommended that in those patients prescribed inhalers that their techniques should be checked and corrected. This action should then be recorded in the case-notes.*

Inhaler at discharge

	INHALER AT DISCHARGE		
	Yes	No	No answer
Teaching (n=495)	328 (66%)	106	61
Large DGH (n=394)	282 (72%)	81	31
Small DGH (n=477)	309 (65%)	98	70
Your site	22 (47%)	17	8

	INHALER AT DISCHARGE		
	Yes	No	No answer
Teaching H (n=468)	326 (70%)	101	41
Large DGH (n=349)	278 (80%)	68	3
Small DGH (n=406)	301 (74%)	79	26
Your site	21 (58%)	14	1

Excluding deaths in hospital, and cases with no date of discharge nor death

Inhaler technique tested and documented

	INHALER TECHNIQUE TESTED & DOCUMENTED				
	No answer	Not applicable	Applicable	Yes	No
Teaching (n=495)	48	119	328 (66%)	107 (33%)	221
Large DGH (n=394)	25	91	278 (70%)	30 (11%)	248
Small DGH (n=477)	63	128	286 (58%)	38 (13%)	248
Your site	3	23	21 (45%)	2	19

	INHALER TECHNIQUE TESTED & DOCUMENTED				
	No answer	Not applicable	Applicable	Yes*	No
Teaching H (n=326)	11	5	310	104 (34%)	206
Large DGH (n=278)	3	7	268	30 (11%)	238
Small DGH (n=301)	18	15	268	35 (13%)	233
Your site	1	0	20	2 (10%)	18

Excluding deaths in hospital, and cases with no date of discharge nor death and including only those with inhaler at discharge.

** percent of total.*

Outpatient respiratory review arranged?

- *It is recommended that an outpatient appointment be arranged with a respiratory specialist for all patients discharged following an acute admission for COPD.*

	OP RESPIRATORY REVIEW ARRANGED		
	Yes	No	No answer
Teaching H (n=468)	273 (58%)	176	19
Large DGH (n=349)	217 (62%)	125	7
Small DGH (n=406)	189 (47%)	202	15
Your site	18 (50%)	18	0

Excluding deaths in hospital, and cases with no date of discharge nor death

Discharge

Length of stay (days) for those discharged alive or to death in hospital

- *LOS is an important factor in healthcare and health economics planning. The 1997 audit revealed large variation in median LOS between centres. Median LOS then was 7 days.*

	LOS		
	Known	Median (IQR)	Mean
Teaching H (n=495)	490	6 (3-12)	9.7
Large DGH (n=394)	382	7 (5-12)	11.0
Small DGH (n=477)	457	7 (4-12)	9.7
Your site	45	Med: 9	15.2

Site variation in median LOS:

Type of Hospital	Median days LOS, by site
Teaching	4, 5, 5, 6, 7, 7, 7, 7, 7, 9, 9
Large DGH	5, 6, 7, 7, 8, 8, 8, 9, 9
Small DGH	5, 6, 6, 6, 7, 7, 7, 8,8,8

Length of stay (days) for those discharged alive:

	LOS	
	Median (IQR)	Mean
Teaching H (n=464)	6.0 (3-12)	9.6
Large DGH (n=347)	7.0 (5-11)	10.2
Small DGH (n=401)	7.0 (4-11)	9.1
Your site	Med: 9	14.2

Site variation in median LOS:

Type of Hospital	Median days LOS, by site
Teaching	4, 5, 5, 6, 7, 7, 7, 7, 7, 9, 9,
Large DGH	5, 6, 7, 7, 8, 8, 8, 8, 9
Small DGH	5, 5, 6, 6, 7, 7, 8, 9, 9, 10

GP Discharge letter present?

- *It is good practice and vital for continuity of care within the community that a discharge letter is sent promptly to the relevant general practitioner. In this audit the presence of a letter at 90 days following admission was accepted as satisfactory.*

	GP DISCHARGE LETTER PRESENT		
	Yes	No	No answer
Teaching H (n=468)	392 (84%)	67	9
Large DGH (n=349)	313 (90%)	30	6
Small DGH (n=406)	347 (85%)	46	13
Your site	29 (81%)	7	0

Excluding deaths in hospital, and cases with no date of discharge nor death

Site variation in discharge letter being present:

Type of Hospital	% cases discharge letter present, by site
Teaching	60, 76, 76, 85, 86, 87, 90, 91, 94, 97, 97
Large DGH	64, 81, 88, 90, 92, 93, 95, 96, 100
Small DGH	48, 83, 83, 87, 88, 89, 90, 91, 97, 97

GP seen patient since discharge:

- *This information was gained from phoning the patients nominated GP surgery at 90 days following admission. It was included in an attempt to look at the feasibility of collecting data concerning the 1ry and 2ry care interface.*

	GP SEEN PATIENT SINCE DISCHARGE				
	No answer	Not applicable	Applicable	YES	NO
Teaching H (n=468)	185	23	260	222 (85%)	38 (15%)
Large DGH (n=349)	171	24	154	107 (69%)	47 (31%)
Small DGH (n=406)	172	6	228	184 (81%)	44 (19%)
Your site	16	6	14	10 (71%)	4 (29%)

Excluding deaths in hospital, and cases with no date of discharge nor death

Clinical data summary: Mortality

- *Mortality is an important outcome indicator used by the NHS in comparative studies of performance. Whilst there are some difficulties in its accurate recording it remains one of the better corroborated outcome measures. 14% of patients included in the 1997 study died within the 90-day period following admission. COPD is known to carry a significant morbidity and mortality. The 1997 study underlines this. The current high death rates should provide evidence for the allocation of greater resources for this group of patients.*

Number of patients

We can identify first time admissions and re-admissions within this audit. For analysis to be patient based we consider the patient follow up data as relating to first admission, and exclude any subsequent re-admissions.

From the 1366 admissions in the study, there was total of 1274 patients.

Type of Hospital	Number of sites	Patients per site
Teaching (n=461)	11	19, 24, 29, 29, 36, 37, 42, 42, 61, 62, 80
Large DGH (n=357)	9	17, 24, 25, 31, 41, 43, 45, 46, 85
Small DGH (n=456)	10	14, 21, 28, 32, 34, 35, 59, 73, 79, 81

Your site : 41 patients

Hospital mortality

	KNOWN TO HAVE DIED IN HOSPITAL	
	Yes	No
Teaching (n=461)	22 (5%)	439
Large DGH (n=357)	32 (9%)	325
Small DGH (n=456)	56 (12%)	400
Your site	7 (17%)	34

Type of Hospital	Number of sites	In-hospital Death rates (%) per site
Teaching (n=461)	11	0, 0, 2, 3, 5, 5, 5, 7, 7, 8, 13
Large DGH (n=357)	9	0, 0, 0, 6, 8, 9, 13, 14, 17,
Small DGH (n=456)	10	3, 7, 8, 12, 15, 17, 17, 18, 21, 24

90 day Mortality

	KNOWN TO HAVE DIED <=90 DAYS OF ADMISSION	
	Yes	No
Teaching (n=461)	55 (12%)	406
Large DGH (n=357)	40 (11%)	317
Small DGH (n=456)	80 (18%)	376
Your site	9 (22%)	32

Type of Hospital	Number of sites	90 day death rates (%) per site
Teaching (n=461)	11	5, 8, 10, 11, 13, 14, 14, 14, 14, 14, 16
Large DGH (n=357)	9	0, 4, 6, 8, 8, 11, 14, 17, 22
Small DGH (n=456)	10	3, 8, 17, 19, 19, 21, 24, 24, 25, 29

Cause of death

- *This group of patients have a high rate of co-morbidity. It was felt important to try and distinguish death from COPD and death from other causes.*

Hospital deaths:

	CAUSE OF DEATH		
	COPD	Other	No answer
Teaching H (n=22)	19	3	-
Large DGH (n=32)	23	5	4
Small DGH (n=56)	40	10	6
Your site	6	1	0

Deaths within 90 days of admission:

	CAUSE OF DEATH		
	COPD	Other	No answer
Teaching H (n=55)	41	7	7
Large DGH (n=40)	24	11	5
Small DGH (n=80)*	53	17	14
Your site	6	3	0

**includes 4 cases with COPD and other.*

Analysis of predictors found from the 1997 BTS audit

- *These next two tables may be helpful in putting some of the above comments in context and allowing comparisons to be made with the current audit data.*

In-hospital mortality

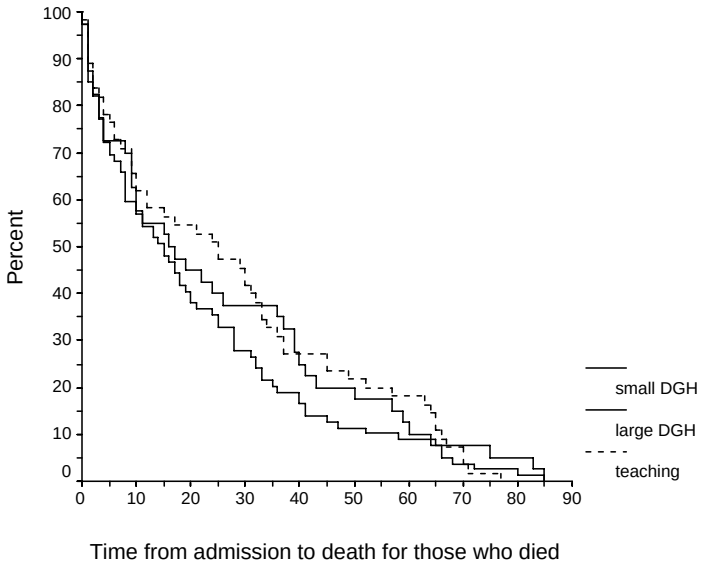
	Teaching Hospitals	Large DGH	Small DGH
Age			
<65	1% (1/85)	1% (1/84)	6% (5/90)
65-74	5% (9/188)	8% (11/130)	11% (20/180)
75-84	6% (9/153)	13% (15/112)	19% (29/155)
85+	9% (3/32)	19% (5/27)	7% (2/28)
Missing	(0/3)	(0/4)	(0/3)
Performance status			
Normal activity	0% (0/57)	7% (3/46)	0% (0/42)
Strenuous activity limited	2% (3/131)	0% (0/89)	7% (8/112)
Limited but self care	4% (5/125)	5% (6/111)	10% (10/103)
Limited self selfcare	5% (4/77)	22% (13/60)	18% (22/119)
Bed, chair, bound	32% (8/25)	63% (5/8)	47% (8/17)
Missing	4% (2/46)	12% (5/43)	13% (8/63)
PH on admission			
<7.26	16% (5/32)	16% (3/19)	41% (12/29)
7.26-7.34	8% (4/51)	10% (5/49)	17% (12/69)
7.35+	4% (12/323)	9% (21/226)	10% (27/271)
Missing	2% (1/55)	5% (3/63)	6% (5/87)
Peripheral oedema			
No	4% (13/318)	9% (21/238)	9% (28/298)
Yes	8% (9/120)	10% (11/113)	16% (18/111)
No answer	0% (0/23)	0% (0/6)	21% (10/47)

90 day mortality, by predictors found from the 1997 BTS audit.

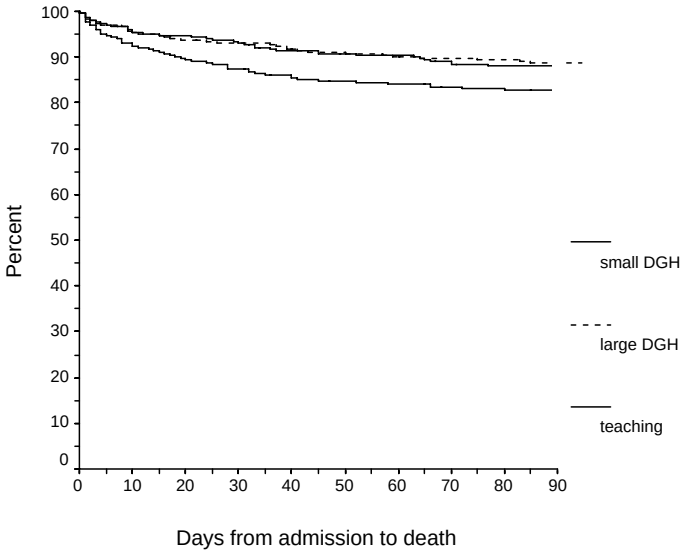
	Teaching Hospitals	Large DGH	Small DGH
Age			
<65	5% (4/85)	1% (1/84)	11% (10/90)
65-74	10% (19/188)	11% (14/130)	16% (28/180)
75-84	15% (23/153)	17% (19/112)	23% (35/155)
85+	28% (9/32)	22% (6/27)	25% (7/28)
Missing	(0/3)	(0/4)	(0/3)
Performance status			
Normal activity	2% (1/57)	9% (4/46)	2% (1/42)
Strenuous activity limited	8% (10/131)	3% (3/89)	15% (17/112)
Limited but self care	12% (15/125)	7% (8/111)	12% (12/103)
Limited self selfcare	17% (13/77)	23% (14/60)	26% (31/119)
Bed, chair, bound	52% (13/25)	75% (6/8)	47% (8/17)
Missing	7% (3/46)	12% (5/43)	17% (11/63)
PH on admission			
<7.26	34% (11/32)	16% (3/19)	41% (12/29)
7.26-7.34	18% (9/51)	10% (5/49)	23% (16/69)
7.35+	9% (30/323)	12% (28/226)	16% (44/271)
Missing	9% (5/55)	6% (4/63)	9% (8/87)
Peripheral oedema			
No	9% (28/318)	11% (26/238)	14% (42/298)
Yes	20% (24/120)	12% (14/113)	24% (27/111)
No answer	13% (3/23)	0% (0/6)	23% (11/47)

Survival curves.

a) For those who were known to have died within 90 days



b) For all patients, assuming patients are alive at 90 days if there is no date of death by 90 days.



Serum albumin, Blood urea and in-hospital mortality

Known values were split into quartiles for these analyses

	Teaching Hospitals	Large DGH	Small DGH
Serum Albumin			
<34	9% (7/75)	18% (13/71)	16% (7/45)
34-36	6% (4/65)	13% (6/48)	10% (4/41)
37-40	3% (3/98)	4% (3/74)	9% (5/55)
>40	4% (3/73)	2% (1/47)	11% (5/45)
Not done	3% (5/150)	8% (9/117)	13% (35/270)
Blood Urea			
<4.8	1% (1/115)	2% (2/98)	7% (7/107)
4.8 – 6.5	5% (6/124)	6% (6/102)	5% (6/110)
6.6 – 8.7	2% (2/94)	7% (5/70)	12% (11/92)
>8.7	9% (9/98)	23% (19/82)	23% (25/108)
Not done	13% (4/30)	(0/5)	18% (7/39)

Serum albumin, Blood urea and mortality < 90 days

Known values were split into quartiles for these analyses

	Teaching Hospitals	Large DGH	Small DGH
Serum Albumin			
<34	19% (14/75)	20% (14/71)	18% (8/45)
34-36	17% (11/65)	15% (7/48)	20% (8/41)
37-40	8% (8/98)	8% (6/74)	18% (10/55)
>40	7% (5/73)	4% (2/47)	13% (6/45)
Not done	11% (17/150)	9% (11/117)	18% (48/270)
Blood Urea			
<4.8	3% (3/115)	3% (3/98)	10% (11/107)
4.8 – 6.5	13% (16/124)	8% (8/102)	8% (9/110)
6.6 – 8.7	11% (10/94)	9% (6/70)	17% (16/92)
>8.7	21% (21/98)	28% (23/82)	31% (34/108)
Not done	17% (5/30)	(0/5)	26% (10/39)

Questions on site facilities.

- *It is of great interest to analyse process of care and outcomes against the range of facilities that are available across hospital sites. Indeed some procedures such as mechanical ventilation may be inappropriate owing to inadequate provision of equipment. Questions were asked to provide a brief précis of the provision available to treat COPD cases. Data were available for 29 sites.*

How many COPD patients does the unit (hospital) see in a year?

Median 450, IQR 300-600, range 90-1748, n=26 sites

This excludes patients sent home from A&E and outpatients.

Of these how many (%) are seen by?

20 sites

	Mean	Median	IQR	Range
Respiratory medicine	46	45	30-60	10-83
General medicine	33	23	20-43	3-90
Geriatric/Care of the elderly	21	20	10-30	0-50

How many of the following staff members are available to treat COPD.? Where Staff are available part time please indicate the WTE (i.e. 0.5)

Respiratory staff (28 sites)

WTE	0-	1-	2-	3-	4-	5-	6+
Consultants	1	6	11	1	5	3	1
Registrars	3	11	9	1	-	1	
SHO's	1	9	9	3	2	1	
PRHO's	1	12	7	1	3	1	
Specialist respiratory nurses	4	12	6	2	1		
Lung function technicians	3	9	5	6	2		

General Medicine (27 sites)

WTE	1-4	5-9	10-14	15-19	20-24	25-29
Consultants	6	13	6	1	1	
Registrars	12	7	2	1		
SHO's	5	13	3	-	1	1
PRHO's	10	10	1	2	1	

Geriatrics / Care of the elderly (25 sites)

WTE	0	1	2	3	4	5	6	7	8	12
Consultants	1	3	1	5	8	2	5			
Registrars	5	3	10	3	1					
SHO's	1	2	5	3	3	2	2	1	2	1
PRHO's	7	3	6	3	1	1	1			

To which method(s) of ventilatory support do you have access?

Invasive	Non-invasive BiPAP	Doxapram	nIPPV	Other
28/28	22/28	26/28	17/28	4/28 (CPA-2 Unknown - 2)

One site added "Invasive support only via ITU SpR".
Another said "BiPAP on ITU".

Do you have access to pulse oximetry?

In A & E 28/28 Yes No A&E (1 site)

On medical wards 29/29 Yes

Do you have access to ABG analysers?

Sited in A & E 14/28 Yes 14/28 No No A&E (1 site)

4/14 saying Yes, indicated that this was on ITU/ICU

Sited on medical wards 10/29 Yes 19/29 No

Only via laboratory service 14 sites

Two sites said yes to 'medical wards' and 'only via laboratory service'. One of these said "only respiratory ward", and the other said "available in ITU and via lab service"

Is routine spirometry available in the following clinical areas?

Sited in A & E	1/27 Yes	26/27 No	No A&E (1 site)
Sited on medical wards	13/29 Yes*	16/29 No	
Only via laboratory service	16 sites**		

**One site said " by respiratory nurse handheld".*
***One site said " Spirometry availability limited in assessment unit"*

Does the hospital run?

Speciality based ward care*	21/29 Yes	8/29 No
A medical admissions unit	26/29 Yes	3/29 No
A medical HDU**	11/29 Yes	18/29 No

**One site said " Partially". Another said "Do have a speciality ward care system but it broke down due to rising numbers of emergencies with many patients scattered throughout the hospital including surgical wards not possible to offer safe service. This is the greatest problem in management."*
** *One site said "Strictly speaking it is a respiratory HDU". Another site said "Ours is surgical, and medicine borrows beds". Another said " A mixed HDU is run".*

Does your site operate an early discharge programme for acute COPD admissions?

10/28 Yes	18/28 No

For 9/10 there was an early discharge <48 hours after admission. One of these sites added that there was an "Early discharge both immediate and up to 48 hours after admission", whilst another said that "Patients were intercepted on MAU and discharged immediately".

General Discussion & conclusion

We hope that the data included herein will be of some interest to all the clinicians involved in this pilot audit work. The RCP/BTS group is most grateful to those who contributed and particularly to the junior staff that often completed returns in their own time.

We acknowledge the limitations of case-note audit of this type but stress that it remains one of the few methods available and one that is regarded by Government as an important method of collecting comparative data. One of the primary aims of this study was to examine the feasibility of collecting data in this manner and to identify some of the limitations and inaccuracies of the methodology.

The further analysis of the audit process questionnaires that accompanied the case record forms for this study is already underway and a further document with this information will be released early next year. We felt it important to release the enclosed clinical information to participants at as early a stage as possible to maintain its relevance to current clinical practice and to those staff involved in the audit itself. It is only through a form of self-examination that we can hope to improve performance in some centres whilst learning from areas of good practice identified in others. Centres that appear to perform poorly may do so for a number of reasons and certainly a lack of resources and low staffing levels have been suggested as important factors. The information included in this document may be useful in bidding for improved resources for your department to meet the BTS standards and those set by the best performing units.

We value your constructive criticism of this report and any other aspects of the national audit of COPD you care to comment on.

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