

British Thoracic Society

National Respiratory Audits

Issue 3, June 2011



Welcome to the third BTS Audit Newsletter

Dr Christine Bucknall, BTS Audit Programme Director

This is the third in a regular series of newsletters from the British Thoracic Society Audit programme.

THIS ISSUE OF THE NEWSLETTER features reports on the 2010 adult and paediatric asthma audits as well as a report from the first audit of non-CF bronchiectasis which took place in October/November 2010.

Publication

We are delighted that Thorax has begun to publish a regular series of national audit reports and the recent national BTS audits of Community Acquired Pneumonia in adults, Emergency Oxygen and Pleural Procedures have all been featured in recent issues. The June edition of Thorax included an editorial on the topic of national respiratory audits, allowing us to highlight the BTS Audit programme's twin aims of quality assurance and quality improvement.

Better data analysis

Earlier this year, we were pleased to be invited to meet the National Clinical Audit Advisory Group, chaired by Professor Nick Black. This provided an excellent opportunity to publicise the BTS national programme and to discuss the challenges encountered in developing the programme and how best to encourage the associated quality improvement work which often needs to be undertaken in response to results. We are currently working on ways to help you use the data to greatest effect for quality improvement (where this is shown to be necessary) and further details will be given on the website in due course. We are currently exploring the

use of more detailed statistical analyses to allow a more realistic representation of the variability of data, to help identify significant outliers.

Reports

Recent months have also seen quite detailed discussions taking place both within the Professional and Organisational Standards Committee and the BTS Executive of the correct approach to the data we are now accruing in order to promote high quality care for respiratory patients. This is likely to result in the data for individual participating sites being more widely available in future. As a first step we plan to introduce a series of reports that allow individual participating sites to compare their data against other (unidentified) sites within their region. We also plan to provide lists of participating hospitals with each national audit report. More detailed statistical advice is currently being sought and when we are certain that we have robust data and systems for identifying outliers, the manner in which the data is reported is likely to change. We hope that this will provide a stimulus to inputting data carefully and accurately, and responding to any identified instances of poor processes of care.

As always, feedback from those participating in our audit programme is very welcome.

*Dr Christine Bucknall
and the BTS Audit Team*

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The European COPD Audit

Thank you to all those who participated in the first ERS European COPD audit. The UK has contributed over 5000 clinical cases to the audit which will report in September/October 2011. The COPD audit is the subject of a symposium at the ERS Congress in Amsterdam on Sunday 25 September – more details available here: <http://www.erscongress2011.org/>

Improve care for your COPD patients!

Take part in the 1st European COPD Audit

 ERS copd audit

2010 National BTS Adult Asthma Audit

Dr Liam Heaney

Overview

The latest BTS audit covers the period between 1st September 2010 and 31st October 2010.

It samples a smaller number of units in the UK compared to the 2009 audit (87 compared to 110) and includes data on 1,932 individual management episodes.

The audit focuses on admission to hospital, management in hospital and discharge arrangements as in previous years, and accordingly allows comparison and identification of any substantial change in the deficiencies which have been identified in previous years.

Admission

The 2010 audit identified a striking female preponderance in admissions (69.3%), which has been seen in previous audits. Whilst this may reflect the fact that most cohorts of difficult to manage / severe asthma have a female preponderance, this may not be the entire explanation and this should be further explored.

Readmission rates are regarded as an important global indicator of good care, particularly in terms of ongoing management post discharge and whether subsequent exacerbations are managed more effectively. In the 2010 audit, the substantial majority of admissions (66.7%) had not been admitted in the

previous year, but disappointingly, 7.45% of all admissions had been admitted in the previous month (which is similar to figures in previous audits). Given asthma admission should be preventable, further scrutiny of the factors driving readmission is warranted.

Assessment

Peak expiratory flow (PEF) is still the most easily available index of severity of airflow obstruction for acute attacks of asthma and should generally be performed in all circumstances.

Measurement and monitoring of this informs management decisions at several points in the patient pathway, and evidence of accurate recording is therefore an important quality marker. The 2010 audit found PEF data recorded in 87.4% of cases, which is identical to that in the 2009 audit and includes patients whose peak flow was too low to register. Previous audits have demonstrated similar problems with objective measurement of the severity of airflow obstruction. Importantly, only 39.2% of assessments had a post-bronchodilator peak flow, and given that the post-bronchodilator peak flow informs either potential discharge or the requirement of admission, this is of some concern. It should be noted however that this figure is an increase from the 2009 figure of 31.9%.

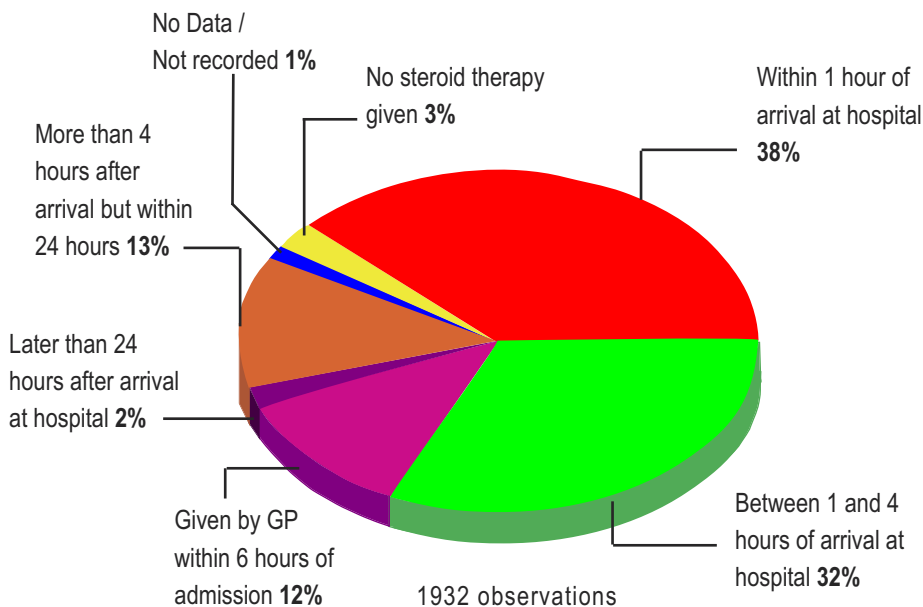
Oxygen saturation was recorded in 97.5% of assessments, and similarly high acquisition levels have been shown in other audits, undoubtedly reflecting the ease of measurement and the obvious value of saturation readings. In subjects with oxygen saturation below 92% on room air (19% of all assessments where oxygen saturation was measured), only 69% proceeded to blood gas measurement as recommended by BTS/SIGN Asthma Guidelines. Of note, 41% of assessments had blood gases performed and many of these were presumably in subjects with oxygen saturation above 92% and potentially not required. Hypercapnia was seen in 113 subjects, which is 14.1% of all subjects where a blood gas was performed.

Treatment

Asthma is a steroid responsive condition and National and International Guidelines advise early treatment with systemic steroids (Figure 1). Only a minority of patients did not receive systemic steroids (3% of assessments) – it is not possible to gauge if patients refused steroids or there was some contra-indication to treatment in these cases. Half of patients had either received steroid treatment prior to arriving at hospital (12%) or were given steroids within an hour of arrival in hospital (38%) in line with current Guidelines. However, there

is clearly room for improvement here but it is not possible to identify from the Audit information what was the 'barrier' to rapid prescription (and presumably administration) of systemic steroids.

Figure 1. Assessment at admission: treatment with systemic steroids



In hospital peak flow monitoring was performed in 84.4% of cases which is similar to recent audits – it is not possible to comment on the cases where this was not performed and whether it related to issues such as specialty versus general ward admissions etc, however given the relatively high level of peak flow monitoring, this seems unlikely to be the sole explanation.

Only 176 (9% of total) patients were recorded as non-adherent with medication, which given the high prevalence of poor adherence data in subjects with difficult to control asthma and data from prescribing databases clearly associating poor adherence with hospital admission, means this is likely to be a significant underestimate. Hospital admission is an important opportunity to identify non-adherence with medication and action plans, and simply asking the patient is usually inadequate. Future asthma management guidelines should consider how best to identify and address non-adherence during a hospital attendance.

Inhaler technique was reviewed in 47% of cases and as can be seen in figure 2, a significant proportion needed some form of correction. Preventer therapy was increased in 31.2% of

cases– again this change in therapy assumes that patients were adherent with their maintenance medication on admission, which is frequently not the case.

158 subjects were listed as a new diagnosis of asthma but surprisingly only 77.8% of subjects were started on inhaled steroids – future audits should inquire further analysis should be performed to try and identify why this did not occur.

Review arrangements

In terms of review after discharge, 68.8% of patients had a hospital review arranged within 4 weeks but only 37.4% were advised to attend their GP within 1 week. Importantly, only 39.8% were had their action plan reviewed or were provided with a written action plan. Given the strong evidence for written action plans, an opportunity is being missed to address this deficit.

Finally, a comment that whilst a National audit provides a broad overview, certain challenges will provide very specific difficulties for individual areas and will impact on individual hospitals. For example, one clinical site documented that 25 of their 34 patients (75%) recruited during the audit period were

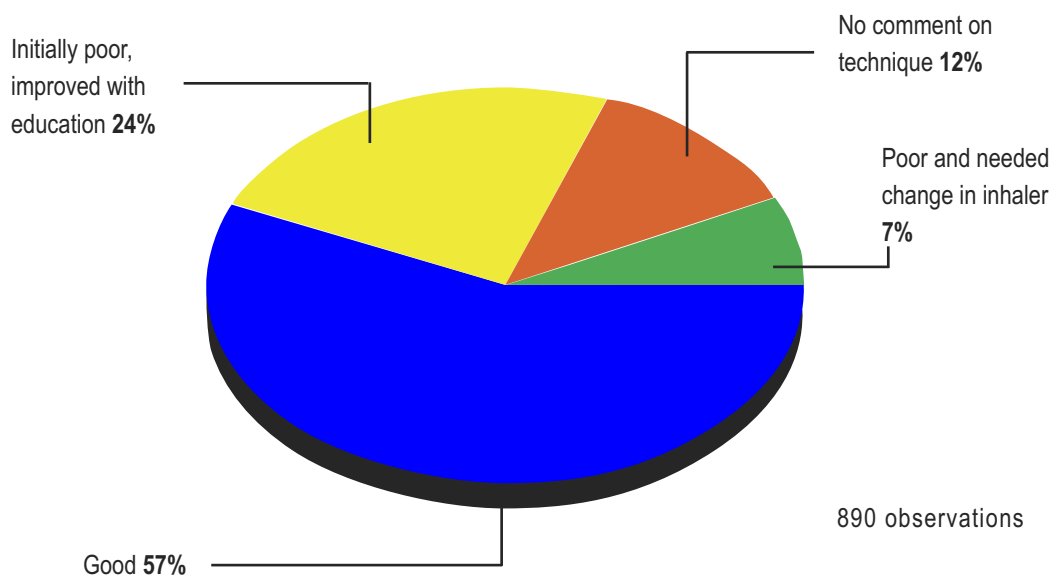
smokers and 8 admitted to regularly using illicit drugs (7 cannabis smokers, 1 crack-cocaine smoker). Clearly such demographic factors will have a significant impact on many aspects of presentation and self-management.

Summary

The 2010 BTS audit has provided a useful snapshot of some aspects of care for acute asthma admissions in the UK. Unfortunately some of the deficiencies remain similar to the 2009 audit, suggesting that publishing and distribution of the 2009 audit has not delivered substantial changes in practice. Given that one purpose of audit is to try and identify deficiencies and address these, followed by repeat audit to demonstrate improvement, some thought should be given to how such audits are disseminated and actioned; perhaps targeting one specific deficiency with a dedicated strategy might be worth consideration.

The audit also poses some interesting and important questions, which cannot be addressed from the information provided in the audit. Again some thought should be given to addressing some of these questions either by further separate analysis or in future audits.

Figure 2. Discharge from hospital: Quality of review of inhaler technique



National Review of Asthma Deaths

BTS is delighted to be working with the Royal College of Physicians, London, on the new National Review of asthma deaths which has recently been commissioned by the Healthcare Quality Improvement Partnership on behalf of the Department of Health in England.

The aim of the review is to improve understanding of why people die from asthma in order that deaths can be prevented in the future. The project will include a clinical audit of asthma deaths in association with a confidential enquiry. Further details will be made available via the BTS website in due course.

2010 National BTS Paediatric Asthma Audit Report

Dr J Y Paton

THE BTS PAEDIATRIC ASTHMA Audit collects data on every child over 1 year of age admitted to hospital with wheezing or asthma during the month of November. The data collected is grouped into 5 areas: basic demographic information such as age and sex; initial hospital assessment; initial hospital treatment; discharge treatment and asthma attack management planning; and plans for follow-up. These are generally process measures rather than true outcome measures. Asthma admissions are common in the winter months so the November audits provide a snapshot of hospital paediatric acute asthma care at one of the busiest times of year.

Readers of last year's report will know that the paediatric asthma audit started in 1998¹. Each year since, participating hospital units have been asked to complete a simple dataset based on the BTS/SIGN asthma guidelines. For the last two years, the paediatric asthma audit (along with the BTS audit of paediatric pneumonia) has been included on the list of National audits approved for inclusion in Department of Health (England) Quality Accounts. Quality accounts will be reports, published annually, about the quality of services provided by each NHS healthcare provider. The reports will be available to the public each June with the first statutory Quality Accounts due to be published first in June 2010 covering activity for 2009/10.

Country	Contributing Trusts	Gender		Total
		Female	Male	
England	81	708	1206	1914
Jersey and Guernsey	1	4	6	10
Northern Ireland	7	33	43	76
Scotland	7	51	85	136
Wales	1	9	19	28
Total	97	805	1359	2164

The inclusion of the paediatric asthma audit as one of the National audits has clearly stimulated interest. This year, 97 Trusts entered 2164 cases. This represented a substantial increase from the previous year (57 Trusts, 1543 cases). Although Quality Accounts only apply to England and Wales data continues to come from all other parts of the UK.

One continuing finding from the audit is that measurements of vital signs at presentation have remained stable. For example, the mean pulse, breathing rate and oxygen saturation at admission has changed little since the audit began suggesting that underlying the severity of asthma in children presenting to hospital has also remained similar.

Essentially all children receive the initial treatments recommended in BTS/SIGN asthma guidelines². So ninety seven percent received beta agonist bronchodilators with a third treated by nebulizer alone, a third by spacer alone, and a third treated a third by a combination of nebuliser and other devices. Half the children

also received ipratropium. Eighty one percent received corticosteroids. (Figure 1).

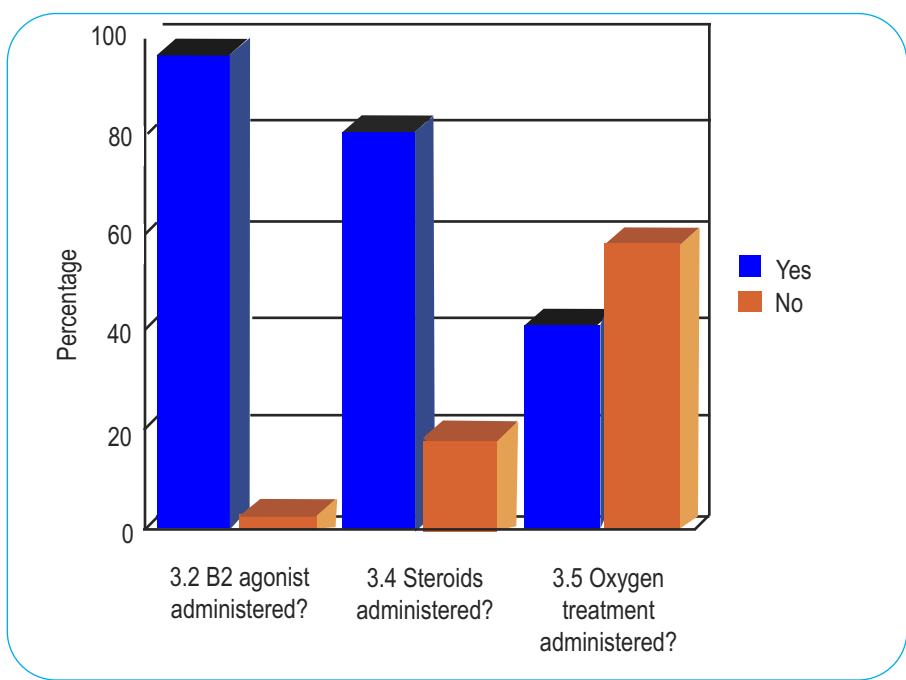
For most children, the initial treatment is highly effective with short length stays of a day or less and only 3.7% admitted to PICU, or receiving second line treatment – around 3% received IV aminophylline, 3% IV Magnesium and 3% IV Salbutamol.

Although evidence suggests only 10-12% of children require a CXR, a relatively high number of children continue to be X-rayed (29%), and then given antibiotics (24%). However, the variation between trusts is striking - shown in the funnel plot below where the expected number of X-rays is based on an expected X-ray rate of 12%.

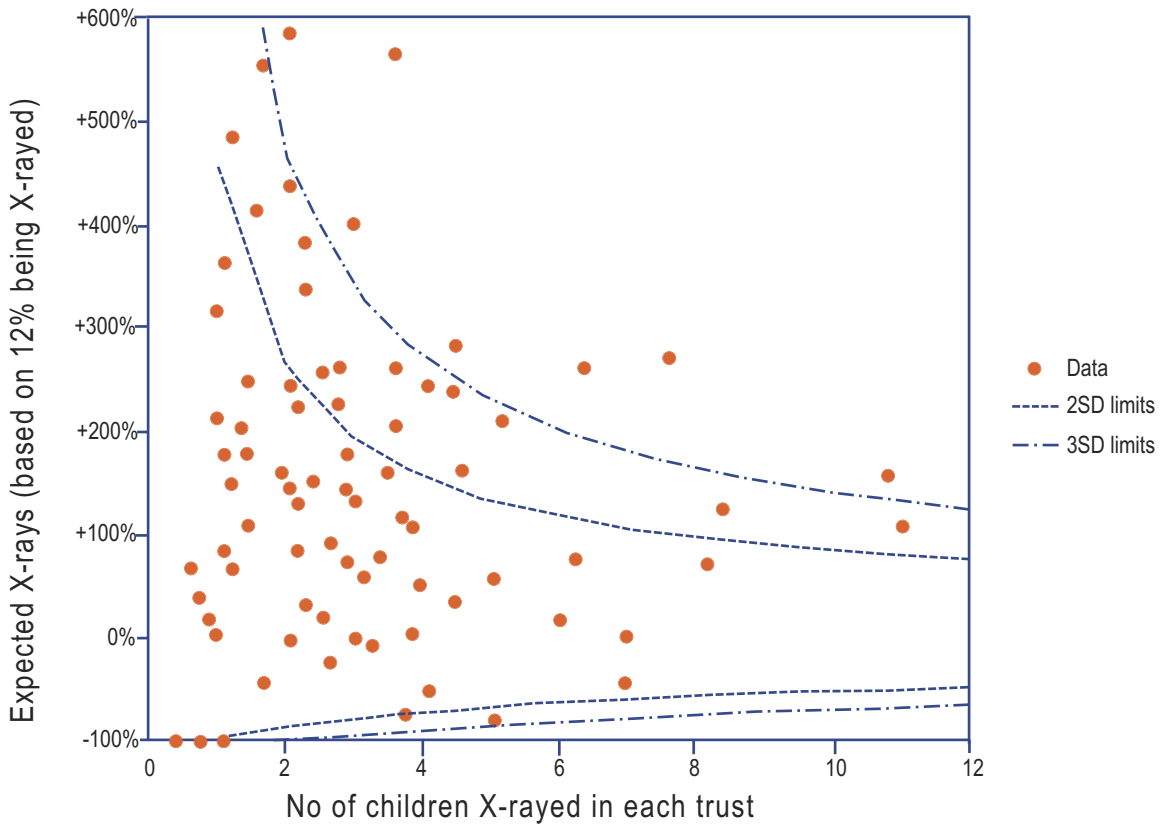
From the audit data, the area where care is least well done is around discharge planning. Published evidence suggests this is an important part of acute asthma management to address because good discharge planning and education can reduce the number of future asthma readmissions substantially. However, in the audit only 43% of children are recorded as having their device use checked and only 45% are recorded as being given a written discharge plan. The graph of the percentage of children in each unit recorded given (or given previously) a discharge plan illustrates the wide difference in performance between units.

Finally, the audit continues to highlight areas where research is needed. For example, the proportion of children under 5 years being admitted appears to be increasing compared with previous years data. Yet this is an area where the current evidence base is most deficient.

Age	1998	2005	2010
Under 5 yrs	61%	64%	71%
5 - 12 yrs	32%	31%	27%
>12 yrs	7%	5%	4%



Funnel plot of children with acute asthma receiving CXR



Where next?

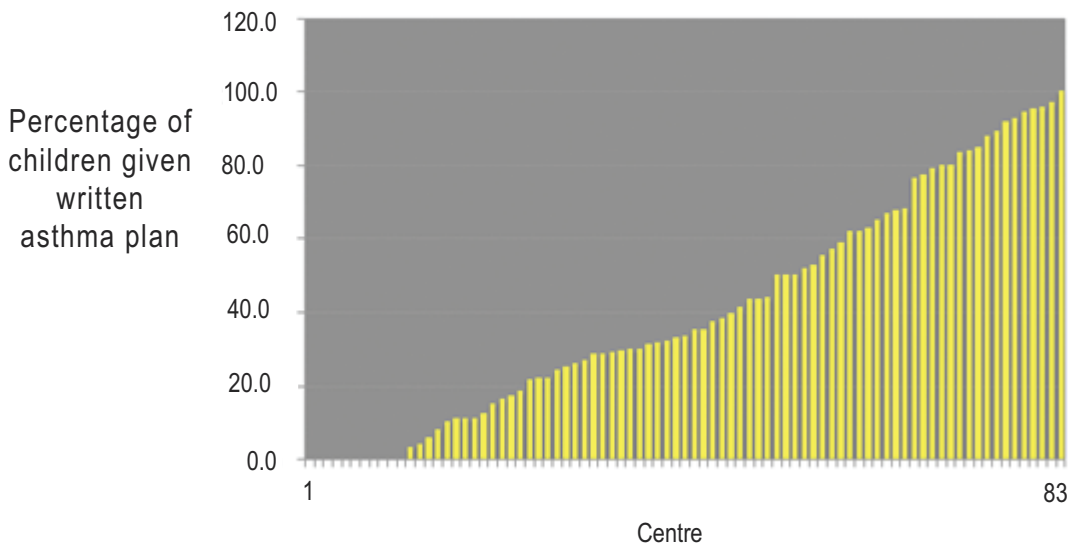
Planning is under way for the next audit in 2011. We will continue to make technical improvements to the electronic form especially around data validation during data entry. We will also have plans to improve the report.

However, the main challenge is now back to the individual units – how can you use the information to improve asthma care in your unit. From this year’s evidence the biggest gains are likely to come from focusing on discharge planning.

Finally, I would again like to thank everyone at the BTS for their continuing hard work in bringing audit in respiratory medicine into the main stream. If you have comments or suggestions I would be very pleased to hear from you. (james.paton@glasgow.ac.uk).

1. BTS Audit Newsletter No 1, <http://www.brit-thoracic.org.uk/audit-tools.aspx>
2. BTS/SIGN British Guideline for the Management of Asthma, 2011

Graph of Percentage of children noted as given (or previously given) a written asthma plan for each centre



2010 National BTS Bronchiectasis Audit

Adam T Hill, Sally Welham, Kerry Reid, Christine Bucknall

Thank you to everyone who participated in the first BTS secondary care audit of non-cystic fibrosis bronchiectasis. The audit captured data from the period of 1 Oct 2010 till 30 Nov 2010. The audit was carried out following the publication of the BTS guidelines on non cystic fibrosis bronchiectasis.¹ Standards for the audit were drawn from the BTS Guideline for non-CF Bronchiectasis and is available from: <http://www.brit-thoracic.org.uk/guidelines.aspx>. We present the gold standards and the results from the National Audit.

Patient profile

There were 1,501 records throughout the UK. 60% of those included were female with a mean (SD) age of 66 ± 15 years. From the sputum microbiology in the preceding year, *Pseudomonas aeruginosa* was isolated in 21%, of which 28% were resistant to ciprofloxacin and 14% to gentamicin. In the last year the mean (SD) number of exacerbations was 2.6 (2.5).

Standard 1

90% of patients diagnosed with bronchiectasis should have had the diagnosis confirmed with a chest CT.

In this audit, 93% were diagnosed with a CT of the chest, 1% by bronchogram, 3% had a clinical diagnosis only and 3% there was no data.

The first standard was met.

Standard 2

90% of patients diagnosed with bronchiectasis should see a chest physiotherapist.

In this audit, 65% of patients had seen a chest physiotherapist, 23% had not and in 12% there was no data. (Figure 1)

The second standard was *not* met which is in keeping with clinical experience that not all patients with bronchiectasis have seen a chest physiotherapist to be taught chest clearance techniques.

Standard 3

All patients being seen should have a record of cough, sputum purulence, estimated or measured 24 hour sputum volume and breathlessness when clinically stable.

In this audit, 70% had a record of cough, 68% of sputum colour, 49% of 24 sputum volume and 55% of breathlessness.

The third standard was not met. These questions are designed to allow a consistent assessment to help the ongoing management of such patients.

Standard 4

All patients diagnosed with bronchiectasis should have their immunoglobulins and protein electrophoresis checked along with Immunoglobulin E (IgE) and IgE to aspergillus or skin prick testing to aspergillus and for those aged <40 years old tests to exclude cystic fibrosis (CF).

In this audit, 77% had their immunoglobulins checked, 58% had serum sent for protein electrophoresis, 75% had IgE measured and 53% had aspergillus fumigates RAST or skin prick test to aspergillus. For those aged <40, 30% had CF gene analysis and 46% had a sweat test carried out.

The fourth standard was *not* met. This is an area that would merit improvement to standardise baseline investigations in secondary care for all patients with bronchiectasis. The management of patients may differ if an immunodeficiency or CF was identified.

Standard 5

All children who are old enough (usually age over 5 years) and adults should have measures of FEV₁, FVC and PEF.

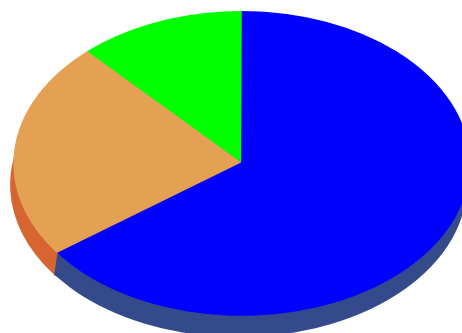
Repeat assessment of FEV₁, FVC and PEF should be made at least annually in those patients attending secondary care.

FEV₁ and FVC should be measured before and after intravenous (IV) antibiotic therapy as this may give objective evidence of improvement.

Spirometry and lung volumes should be measured in all patients before and after commencing long term oral or nebulised antibiotic therapy.

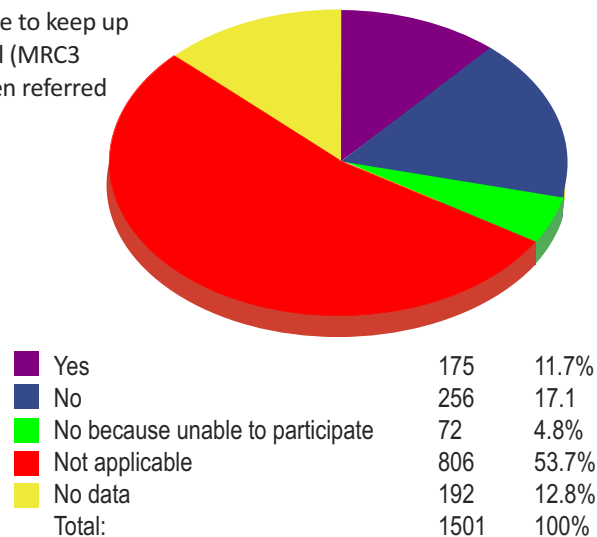
In this audit, 60% had spirometry measured on the day of consultation but no data in 4%. For those that did not have spirometry on the day, the median (interquartile range) months that there was the most recent record of spirome-

Figure 1. Has the patient ever seen a specialist respiratory physiotherapist?



Yes	974	64.9%
No	349	23.3%
No data	178	11.9%
Total:	1501	100%

Figure 2. If the patient is unable to keep up with peers walking on flat level (MRC3 breathlessness), have they been referred for pulmonary rehabilitation?



try was 6 (3-13). 16% had received IV antibiotics in the past 1 year. For patients that received IV antibiotics, 22% had spirometry assessed before and after a course of IV antibiotics, 56% did not and for 22% there was no data. 10% had received nebulised antibiotics for more than 28 days within the past 12 months. Of those receiving nebulised antibiotics, 63% had spirometry checked at the start and later on during the treatment, 20% did not and for 17% there was no data. Of those receiving nebulised antibiotics, 82% had spirometry checked at least 6 monthly.

The fifth standard was *not* met. Spirometry may be useful to monitor disease progression and response to treatments.

Standard 6

This provided a snapshot view of patients' long term therapy. There were no specific recommendations regarding use of short and long acting bronchodilator therapy but routine inhaled corticosteroids were not recommended unless there is coexisting asthma or COPD. There is a lack of evidence base regarding the use of agents that improve mucociliary clearance and randomised controlled trials are needed. Patients having three or more exacerbations per year requiring antibiotic therapy or patients with fewer exacerbations causing significant morbidity should be considered for long term antibiotics.

Regarding bronchodilators, 66% were

on a short acting beta 2 agonist and 11% were on a short acting anticholinergic. 65% were on a long acting beta 2 agonist and 29% on a long acting anticholinergic.

81% were on inhaled corticosteroids with a mean (SD) dose of 1252 (720) mcg/day (beclometasone dipropionate equivalent dose). The audit did not ask about co-existing conditions including asthma or COPD.

For agents that improve mucociliary clearance 27% used carbocysteine and 6% nebulised saline (38% used 0.9% saline and the remainder used higher concentrations varying from 3-7%) but there was no-one on inhaled mannitol or nebulised DNAase.

Regarding long term antibiotics 27% used long term oral antibiotics (>28 days) and 9% nebulised antibiotics (76% nebulised colomycin, 13% gentamicin and 5% tobramycin).

Standard 7

90% of patients with an exacerbation should have a sputum sample sent for microbiological culture prior to empirical antibiotic treatment.

In this audit, 55% did, 42% did not and there was no data recorded for 3%.

The seventh standard was *not* met. Monitoring sputum microbiology is key to providing appropriate antimicrobial prescribing.

Standard 8

Pulmonary rehabilitation should be offered to individuals who have MRC grade

three breathlessness affecting their activities of daily living.

For 54% of cases included this was not applicable and for 13% there was no data recorded. 12% had been referred but 17% had not. 5% of cases were eligible but unable to participate in pulmonary rehabilitation. (Figure 2)

The eighth standard was *not* met. Pulmonary rehabilitation in such patients has the potential to improve patients exercise capacity and general wellbeing.

Summary

This national audit has provided a key snapshot how non-cystic fibrosis is managed in secondary care. The majority of standards were not met. In the past the profile of bronchiectasis has been very low and it is hoped that the creation of national guidelines, local changes in the organisation of care to promote good practice, and ongoing audit and research will raise the profile of the disease and quality of care. The standards from the BTS guideline are good quality indicators and will provide a useful tool for monitoring the quality of care in future years.

Reference

1. British Thoracic Society Guideline for non-CF bronchiectasis. Pasteur MC, Bilton D, Hill AT; British Thoracic Society Bronchiectasis non-CF Guideline Group. *Thorax*. 2010 Jul;65 Suppl 1:i1-58.

Top tips for BTS Audit Tools

Christopher Routh

AWARE OF THE TIME CONSTRAINTS on clinicians and audit departments, the BTS audit tool system has been designed with ease of use in mind. Here are a few easy tips to speed up the process.

1. Download the data collection sheets

Each of our audits has associated data collection sheets (in pdf format) which can be downloaded to your computer. You can print as many of these forms as you need (usually one for each patient) and use them to record all the data *before* you input the data on the system. The data collection sheets will also assist you in identifying quickly any areas of the audit where inadequate records are being kept and for which you need data to complete the audit.

2. Save as you go

If you do not have all the responses to every question available, you should complete as many of the fields as you can and save the record before moving on to the next. Going back into that record later, any fields that are required (marked with an

asterisk on the data collection sheets) will be highlighted in red for you to easily pick up.

3. Share the workload

The system allows you to continue working on a record where a colleague has left off. To find records a colleague has input, use the search facility located below "Add a new Record" (see Fig 1 below). In the *User* field, select the username of your colleague, click on *Search* and any records that you colleague has input will be displayed. You can then continue to add data to these records as necessary.

4. Export your data before you commit it

If you wish to have a copy of your data for your own records it is a good idea to export the data *before* you commit it. This is because when you commit your data, the local patient-identifier is deleted from that record and cannot be recovered in any event. However, if it has been committed you are still able to export your data but any patient-identifiable data will have been removed from the records.

5. Running the reports

To run a report go to *Reports* in the top menu and select the required report from the list displayed. For selected audits there are now three types:

1. Institution vs National. This report is a comparison of your institution's data against the national data set for the same period;

2. Period vs Period. This report is a comparison of any period against any other period for all institutions;

3. Period vs Period – Your Institution. A comparison of any period against any other period for your institution only.

In the following screen, select the audit period from the drop-down menu and click *View Report*. A new window will open and in a few moments your report will be generated. This can be saved to your PC in pdf, word or excel format. The graphs, bar and pie charts can be easily put into Powerpoint presentations by using the standard cut and paste features of your computer.

Fig 1. select other users' records to continue working on them

This is the national audit period.

[Add a new Record](#) Commit Submissions

User: CRouth | Search: Local patient identifier | Value: []

patient identifier [S]

Admin [C]

AJaffe [C]

AMvlotte [C]

Change of hospital address

If you change your hospital address on the audit tool system you will not be able to log back in to your account until we have verified your account. We usually verify your audit tool account within one working day.

Contact us

If you need any help and need further assistance, please call either Sally or Chris at BTS or send an email to: audittools@brit-thoracic.org.uk

BTS Audit Timetable April 2011 – March 2012

Name of Audit	Audit Period	Opening/Closing Date for data entry
Pleural Procedures	1/06/11 – 31/07/11	1/06/11 – 30/09/11
Emergency Oxygen	15/08/11 – 1/11/11	15/08/11 – 15/11/11
Adult Asthma	1/09/11 – 31/10/11	1/09/11 – 31/12/11
Bronchiectasis	1/10/11 – 30/11/11	1/10/11 – 31/01/12
Paediatric Asthma	1/11/11 – 30/11/11	1/11/11 – 31/01/12
Paediatric Pneumonia	1/11/11 – 31/01/12	1/11/11 – 31/03/12
Adult Community Acquired Pneumonia	1/12/11 – 31/01/12	1/12/11 – 31/05/12
Adult NIV	1/02/12 – 31/03/12	1/2/12 – 31/05/12