

British Thoracic Society

National Respiratory Audits

Issue 2 November 2010



Welcome to the second BTS Audit Newsletter

Dr Christine Bucknall, BTS Audit Programme Director

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

The BTS Audit Programme continues to develop apace, and we are delighted that the new system continues to attract new users every week. We are also pleased the Department of Health for England has recommended that BTS respiratory audits are suitable for inclusion in Quality Accounts for 2010/2011. Quality Accounts are annual reports to the public from organisations which provide NHS services, and give information about the quality of the services which that organisation delivers. The Society is particularly pleased that its Audit Programme is fully engaged with the quality improvement agenda in this way.

The 2010/11 cycle of BTS audits is now underway, and we have introduced a new audit for Bronchiectasis, based on the recently published BTS Guideline.

We will shortly be asking you to tell us what you did with the previous results when you log on to participate in a second round of audit – we hope to collate this data in future and feedback on more (and less!) effective change management strategies.

This issue of the newsletter features reports on the 2009/10 adult and paediatric community acquired pneumonia audits as well as a report from the 2010 adult NIV audit.

We are very pleased to announce that reports on each annual national BTS Audit will, in future, be published in *Thorax*, starting with a report on the 2010 pleural procedures audit. Disseminating the national results of audits in peer reviewed journals is important, although within BTS we are also currently considering other ways in which we can use the data to drive improvements in quality of care. It is a real priority to make sure that the results of each audit are used to full effect in quality improvement initiatives in hospitals across the country.

More information on recent results and future plans for the BTS Audit Programme will be explored in the "Best of BTS Audit" (see below for full timetable) to be held during the BTS Winter Meeting, on Friday 3 December – a session to which you are all cordially invited.

Over 140 hospitals across the UK are currently participating in the European COPD Audit. The audit collects information on both the organisation of care within the participating hospitals, as well as data on cases admitted to hospital for an acute exacerbation of COPD.

The data collection period runs from 25 October to 19 December 2010 with follow-up of clinical cases at 90 days after admission. More information is available on the BTS website for participating units at:

<http://www.brit-thoracic.org.uk/audit-tools/european-copd-audit-2010.aspx> or directly from the ERS COPD audit website at:

<http://www.erscopdaudit.org/>

Improve care for your COPD patients!

Take part in the 1st European COPD Audit

 ERS copdaudit

SYMPOSIUM: THE BEST OF BTS AUDIT

Friday 3 December 2010, 1.45pm – 3.30pm,
Churchill Auditorium, Ground Floor, QEII Centre, Westminster

Chair: Professor Nick Black (National Clinical Audit Advisory Group)

1.45pm	The National Scene, Professor Nick Black	2.30pm	The 2009/10 Community Acquired Pneumonia in Adults Audit, Dr Wei Shen Lim (Nottingham)
2.00pm	The BTS Audit Programme, Dr Christine Bucknall (Glasgow)	2.45pm	The 2009/10 Paediatric Asthma and Paediatric Pneumonia Audits, Dr James Paton (Glasgow)
2.15pm	The 2010 National Pleural Procedures Audit, Dr Nick Maskell (Bristol) and Dr Clare Hooper (Bristol)	3.00pm	The 2010 Emergency Oxygen Audit, Dr Ronan O'Driscoll (Salford) and Professor Tony Davison (Southend)
		3.15pm	Discussion/conclusion

Registration and access to the BTS Audit Tools is available at:
<https://audits.brit-thoracic.org.uk>

For all enquiries regarding the audit tools please write to:
audittools@brit-thoracic.org.uk

2009/10 Paediatric Pneumonia Audit

Dr Anne Thomson

Following publication of the 2002 BTS Paediatric Pneumonia Guidelines, a national audit has stuttered into life over a few years and in 2009/10 recorded data on 891 admissions from 27 institutions – sufficient for a meaningful comment. The case definition is a clinical diagnosis of pneumonia in a child greater than 6 months of age.

The great majority of children admitted were under the age of 5 years (figure 1) and 29% had received an antibiotic before admission for a median of four days.

On admission 39% were hypoxaemic (oxygen saturation less than 92% in air) and 65% of those under the age of 1 year and 30% over the age of 1 year had a respiratory rate greater than 50 breaths per minute. Intercostal recession was noted in 51% of those admitted and 9% were grunting. A high fever exceeding 39 degrees centigrade was noted in 38% of children and wheezing was recorded in 32% of those under the age of 5 years and 28% of those older than 5 years.

The 2002 guidelines recommend blood cultures in all and nasopharyngeal aspirates in those under the age of 2. In practice 54% of children admitted had blood cultures done and 21%, a nasopharyngeal aspirate. In addition 10.4% of children had blood taken for acute serology but only 0.2% had both acute and convalescent serology performed. These investigations revealed a causative organism in 149 children with the commonest being respiratory syncytial virus found in 52, followed by Strep pneumonia identified in 32 children, and in 10 children influenza H1N1

was the responsible organism. All children had a chest x-ray performed and it was abnormal in 85% with lobar consolidation identified in 47% of cases.

The general management of these children reflected their clinical condition with 48% receiving oxygen therapy and 35% bronchodilators. Rather surprisingly 29% had intravenous fluids and 4% nasogastric fluids. The 2002 guideline indicates that chest physiotherapy is not beneficial in pneumonia but 15% of children nevertheless received physiotherapy. 3% of children were sufficiently unwell to require assisted ventilation.

Nearly all children were treated with antibiotics (97%). A large variety of antibiotics were prescribed but the most common at any age group was Augmentin with 324 prescriptions (29.7%) in children under the age of 5 and 139 children (25.5%) of those over the age of 5. This was closely followed by Amoxicillin prescribed in 230 children (21.1%) under the age of 5 and 83 children (15.2%) over the age of 5. There were 220 prescriptions of Macrolide in children under the age of 5 years (20.2%) and 127 prescriptions (23.4%) in children over the age of 5 years. The 2002 guidelines suggested that Amoxicillin was the first choice for overall antibiotic therapy in children under the age of 5

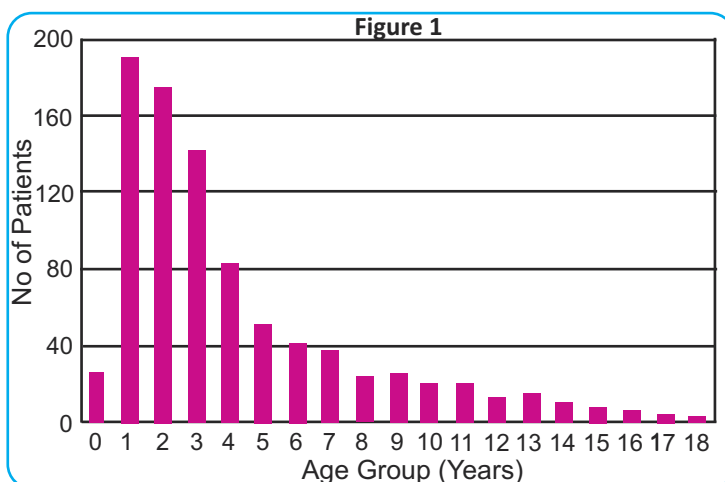
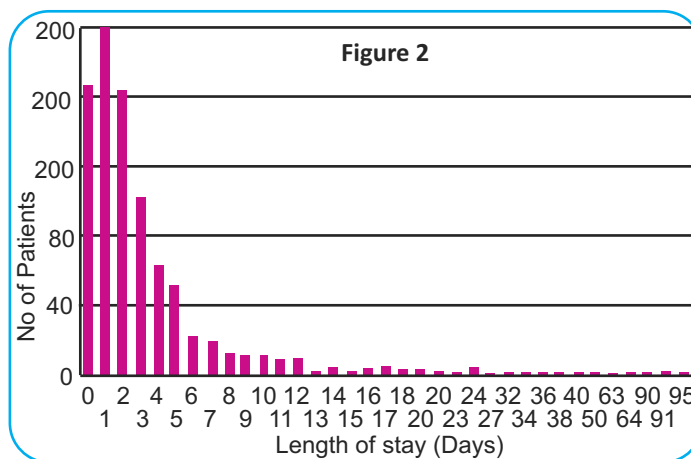
and at any age Strep pneumonia was thought to be the most likely pathogen. It is clear that many children received more than one antibiotic and the data has not been analysed

separately to see the proportion of children who received oral antibiotics only.

Of all the children admitted to hospital some 13% also had asthma and 20% another co-morbidity. A great majority of children however responded to treatment very quickly and were in hospital for less than 3 days (figure 2). Complications occurred in 9% of children, the most common being empyema (7%). Despite having an illness which responded rapidly to treatment some 36% of children were seen at hospital for follow-up. The 2002 guidelines suggest that follow-up of chest x-rays are only required for children with lobar collapse or an apparent round pneumonia. In this audit some 15% children had a chest x-ray at follow-up which is likely to be substantially more than those recommended in the guideline.

This 2009 paediatric pneumonia audit gives an interesting perspective on how children are currently managed for pneumonia in hospital. The vast majority seem to be treated appropriately and recover promptly from their illness. The BTS audit system allows individual units to compare themselves with their colleagues around the country as well as with the features of the guideline. There are clearly some areas where there could be improvement which would both be of benefit to children and to the cost of providing their care in hospital.

The paediatric pneumonia guidelines are currently under revision and the new version should be published in 2011. An amended paediatric audit form will be available for the 2011 audit round.



2009/10 Adult Community Acquired Pneumonia Audit

Dr Wei Shen Lim

Thank you to everyone who participated in the first BTS-wide audit of the management of Community Acquired Pneumonia (CAP) in adults. The audit captured data relating to acutely ill medical patients admitted to hospitals in the UK within the period 1 December 2009 and 31 January 2010. There were a total of 2,749 submissions from 64 institutions spread throughout the UK, making this the largest BTS Audit to date, and one of the largest audits of CAP anywhere.

The size of this audit means that the data are both meaningful and representative of what happens in practice. In this Report, the main results of the audit are discussed together with areas for potential improvement. A presentation of the Results will also be given at the BTS Winter Meeting 2010.

Patient profile and outcome

The mean age of cases was 71 years and over half (52%) were female. The 2 commonest comorbid illnesses were chronic heart disease (23%), excluding hypertension and COPD (22%).

Based on the CURB65 score, 40% of patients had low severity CAP (score 0 to 1), 30% moderate severity CAP (score 2) and 30% high severity CAP (score 3 to 5).

The average length of stay was 5 days and critical care admission was required in 7% (n=193). Critical care advice was received in 102 of 316 cases with CURB65 scores of 4 or 5. Overall, 582 (21.2%) patients died while an in-

patient. Readmission rate within 30 days of discharge was 8.3%.

Interpretation:

- CAP mostly affects older persons, although a third are under 65 years old.
- The proportions of patients with low, moderate and high severity disease are similar to findings from cohort studies.
- The relatively high mortality observed in this audit (21%) is greater than that reported by most cohort studies. Analysis is being undertaken to examine this further.
- The readmission rate is close to the national average for all-cause admissions.

Processes of care

Fifty-two percent of patients received the first dose of antibiotic < 4 hours after admission. A further 18% received the first dose between 4 and 6 hours after admission while 20% received antibiotics ≥ 8 hours after admission (Figure 1).

In contrast, the time interval from hospital admission to a chest x-ray was generally short: 41% < 2 hours, 43% 2 to 4 hours, 11% beyond 6 hours.

In 74% of cases, the CXR was reviewed before antibiotics were given. In 21% of cases (n=592), the interval between CXR and first dose of antibiotics was > 4 hours.

Interpretation:

- A first dose of antibiotics is admin-

istered in a substantial proportion of patients (~25%) before confirmation of the diagnosis of CAP (ie. before the CXR is reviewed).

- A substantial minority of patients are waiting a long time before receiving the first dose of antibiotics following hospital admission (16.5% waited > 8 hours).
- The delay to administration of antibiotics does not appear to be due to a delay in obtaining a CXR in most cases. It is probably related to a delay in review and interpretation of the CXR and processes related to prescribing and administration of antibiotic upon x-ray confirmation of the diagnosis of CAP.

Use of antibiotics

Antibiotics were given in accordance with local CAP guidelines in only 54% of cases.

Overall, initial empirical antibiotics were given intravenously (IV) in 77% (n=2031) of cases.

A beta-lactam + macrolide combination was given in 53% of cases with low severity CAP, 54% with moderate severity CAP and 59% with high severity CAP.

A quinolone antibiotic was given in less than 3% of cases overall.

Interpretation:

- Adherence to local CAP guidelines regarding antibiotic use was low, despite evidence that adherence to CAP guidelines is related to improved outcomes.
- The proportion given intravenous (IV) antibiotics was higher than might be expected based on disease severity alone.
- Based on BTS Guidelines recommendations, there was an overuse of combination antibiotics in patients with low severity CAP.
- In patients with moderate to high severity CAP, there was an underuse of combination antibiotics.

Suggested areas for improvement in management

Aim – To potentially improve outcome:
1) Increase adherence to local CAP guidelines.

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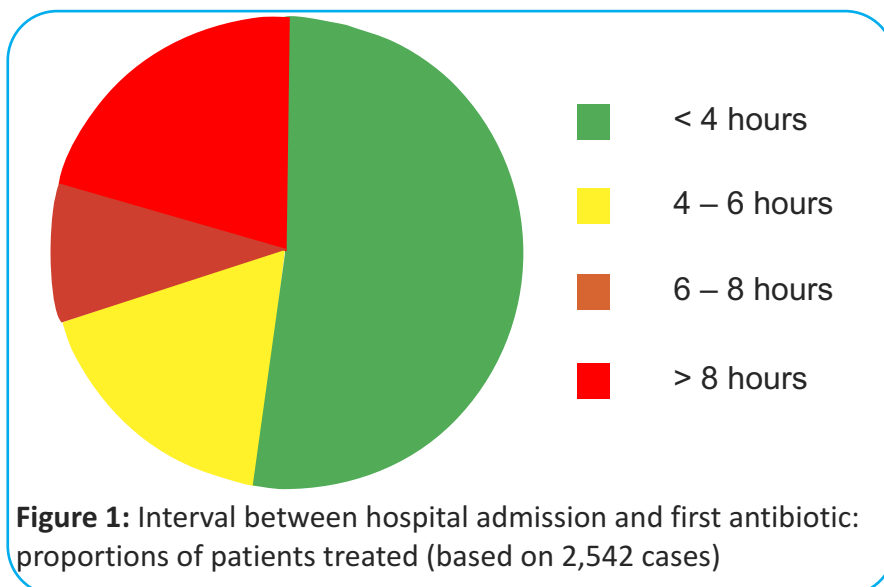


Figure 1: Interval between hospital admission and first antibiotic: proportions of patients treated (based on 2,542 cases)

- 2) Reduce delay from hospital admission to first dose of antibiotics.
- 3) Increase the proportion with high severity CAP receiving combination antibiotics.

Aim – To reduce inappropriate antibiotic use:

- 4) Reduce the proportion receiving antibiotics before the diagnosis is confirmed.
- 5) Reduce unnecessary use of parenteral (IV) and combination antibiotics for low severity CAP.

Summary

This audit has provided unique and representative data on how CAP is managed in hospital in the UK. Most importantly, the results should be of use to local care pathway planning, especially to those units that participated in the audit and have local data on which to base improvements.

In addition, the audit has generated some questions that will need to be answered by further research. As the audit was focused on patients who were

seen and treated following their arrival in hospital, there was no information on the duration of these patients' symptoms, nor of any treatment administered pre-hospital. Both of these factors may have influenced clinical outcomes.

Acknowledgements: Many thanks to Sally Welham and Kerry Reid for all their help and invaluable efforts in running the audit. Thanks also to Christine Bucknall for her advice and expertise especially in the design of the audit. Most of all, thanks to all those who participated! Well done!

2010 Adult non-invasive ventilation audit

Dr Craig Davidson

Thank you to all who participated in the national audit of non-invasive ventilation in adults in February and March 2010, which aimed to enable hospitals to review the effectiveness of acute NIV benchmarked against other contributing hospitals. The audit included questions on cause of respiratory failure and prior lung function, and performance status. Both process and outcome were recorded. 61 hospitals contributed data on 925 patients with a range from 5 to 39 patients treated by NIV over the 2 months. Half were admitted to hospital out of hours and cardiogenic pulmonary oedema was second to AECOPD as the most common reason for NIV (COPD 70%).

As would be expected, performance status was limited in 70% but was very impaired (no self-care/bed or chair-bound) in only 8%. The chest x-ray showed consolidation in 34%; 27% of patients had been given NIV on a previous admission (no data in 20%). Importantly, respondents reported that uncontrolled oxygen therapy had contributed to hypercapnia in 25% with pre-hospital and in-hospital exposure being equally responsible.

The average initial PaCO₂ was 10.2kPa, falling by 1kPa by one hour and 2kPa by 4–6hrs to an average of 7.3kPa at discharge. The average pH was 7.3 at the start of NIV, suggesting that many patients were chronically hypercapnic. This was borne out by a bicarbonate >30 in 50%. Worryingly, metabolic acidosis was also treated by NIV as the minimum PaCO₂ was reported to be 2.9!

We asked if a treatment plan was evident specifying progression to intubation or NIV removal in the event of failure. Treatment plans were documented in 72%. Within this group, NIV was planned as "ceiling therapy" in 70% with intention to escalate to IMV in 19% with palliative intent in 7% with only 2% having no data. However, in reviewing outcome, only 2.3% were invasively ventilated although NIV was reported as unsuccessful in 27%. It therefore seems that, despite intention, patients did not always progress to intubation when failing to improve with NIV. This is difficult to understand although the intubation rate is similar to national data (1). Disappointingly care plans were rarely dis-

cussed with the ICU (30%) and patient or carer involvement in decision-making was also uncommon at 36% although no data was available in a further 24%. Advance directives were very infrequent (4.4%). It is of some concern that for patients (and for consultants), the care plan was reportedly decided following discussion with a consultant in only 30%.

For a group of patients with a high-risk of re-admission or early death, it is surprising that there was no hospital follow-up in at least one third of cases. On the other hand 9% were discharged home on NIV and 23% on LTOT. Given the high incidence of chronic hypercapnia and recent evidence in favour of home NIV (2) perhaps this should be the other way round? This remains a contentious issue (3) and hopefully the recently launched national study of NIV v LTOT will finally provide the answer (4).

This data provides a fascinating snapshot of 'real life' NIV. The results are largely encouraging in comparison with a report based on the 2005 national COPD audit (5). However, it is likely the good success rates represent the results from better and more enthusiastic providers. This is the first national prospective audit of NIV and provides excellent benchmarking data for units to evaluate their own performance. It also highlights areas for attention such as senior involvement in decision-making, the use of NIV in patients with pneumonia (30% had CXR consolidation) and the need for specialist follow-up of high risk patients.

How should the results of such audits be used in the future? Should NIV process and outcome be used as performance indicators of hospitals in the same way that ICU performance is judged on the basis of outcomes? The writer believes this is the way to improve standards and that enrolling most hospitals in the forthcoming repeat audit in February & March 2011 will provide even more useful data. In the meantime, hospitals can continue (or start) to use the audit tool on a local basis to generate reports on their performance.

Comments and suggestions on improving the audit in 2011 are welcome. Please write to: audittools@brit-thoracic.org.uk

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2. Windisch W, Haenel M, Storre JH & Dreher M. High intensity non invasive positive pressure ventilation for stable COPD. *Int J Med Sci*. 2009, 6: 72-76.
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