BTS guidelines for the management of community acquired pneumonia in children: summary of key points for primary care

SECTION 1 INTRODUCTION

This synopsis summarises the British Thoracic Society (BTS) key points and recommendations for the management of childhood community acquired pneumonia (CAP) in primary care. The strength of each is qualified by a letter in square brackets. Details can be found in the main text which has been published separately as a supplement to *Thorax* (2002;**57**:Suppl I).

1.1 Introduction

Evidence based strategies are increasingly important, particularly when recommending treatment of a common condition associated with significant morbidity and use of health service resources.

1.2 Who are these guidelines aimed at?

These guidelines are for general practitioners who care for children with pneumonia in the UK or in similar healthcare systems.

1.3 What is the role of the GP in the management of CAP?

Most children will be managed in the community. The GP's role is to:

- identify that the child has an acute respiratory infection;
- assess severity;
- provide information and general management advice to parents and carers;
- provide (specific) medical treatment where necessary;
- monitor progress (and refer for further advice or investigation when appropriate).

1.4 What patient groups are we including and excluding?

The patient group includes immunocompetent children older than 4 weeks but excludes those with cystic fibrosis, sickle cell disease, tuberculosis, or malaria. Viral lower respiratory tract infections such as respiratory syncytial virus (RSV) bronchiolitis are referred to only in passing.

1.5 How do we define community acquired pneumonia (CAP)?

A clinical definition depends on the signs and symptoms of pneumonia in a previously healthy child due to an infection acquired outside hospital. Where radiographs can be obtained, this can be confirmed by radiological evidence of consolidation, but otherwise the term "acute lower respiratory tract infection" is more practical. A microbiological definition remains uncommon: many studies reflect the difficulty in identifying pathogens and the need for improved diagnostic techniques.

The World Health Organisation term "acute respiratory infection" is more helpful for primary healthcare professionals since it does not rely on radiological findings and reflects the fact that many infections in younger children will have a viral aetiology.

1.6 Guidelines Committee membership

The Guidelines Committee comprised three paediatricians with a special interest in respiratory paediatrics, a paediatrician with a special interest in infectious diseases, a specialist registrar in paediatrics, a paediatric nurse, a general practitioner and a guidelines methodologist.

Electronic searches of the Cochrane Library and Medline were performed with help from an information specialist. Two group members assessed the quality of the studies appraised.

The search strategy is shown in Appendix 1 of the main text and details of quality assessment in table 1 on page i1.

SECTION 2 INCIDENCE AND MORTALITY

2.1 How common is childhood CAP?

There are no recent prospective studies.

The average UK GP with a list size of 1700 will see 4.3 cases of radiologically confirmed pneumonia per year in children <5 years of age and 8.2 cases in children aged 5–14 years (based on Finnish data).

2.2 What is the mortality of CAP in the UK?

Mortality is low in developed countries.

SECTION 3 AETIOLOGY AND EPIDEMIOLOGY

3.1 What are the causes of CAP in children in the UK?

Key points

- *Streptococcus pneumoniae* is the most common bacterial cause of pneumonia in childhood.
- Age is a good predictor of the likely pathogens:
- Viruses are most commonly found as a cause in younger children.
- In older children, when a bacterial cause is found it is most commonly *S pneumoniae* followed by mycoplasma and chlamydial pneumonia.

SECTION 4 CLINICAL FEATURES

The common clinical features are shown in table 1.

Key points

- Bacterial pneumonia should be considered in children up to 3 years old when there is fever >38.5°C along with chest recession and respiratory rate >50/minute [**B**]. For older children a history of difficulty in breathing is more helpful than clinical signs.
- If wheeze is present in a preschool child a primary bacterial pneumonia is unlikely [**B**].

Table 1 Common clinical features

Bacterial LRTI	Viral LRTI	Mycoplasma LRTI
	Infants and young children	Schoolchildren
Fever >38.5°C	Fever <38.5°C	
RR >50/min	RR normal or raised	
Chest recession	Marked recession	
Wheeze not a sign of primary bacterial pneumonia	Wheeze	Wheeze
Consolidation rather than collapse	Hyperinflation (Patchy collapse in 25%) Lobar collapse when severe	Interstitial infiltrates, lobar consolidation and hilar lymphadenopathy
Viruses may be concurrent		

SECTION 5 RADIOLOGICAL, GENERAL & MICROBIOLOGICAL INVESTIGATIONS

The authors of a systematic review on the value of chest radiographs in ambulatory children concluded that routine use of chest radiography was not beneficial in children over 2 months.

Key points

- Chest radiography should not be performed routinely in children with mild uncomplicated acute lower respiratory tract infection [**A**].
- Radiographic findings are poor indicators of aetiology.
- Follow up chest radiography should only be performed after lobar collapse, apparent round pneumonia or for continuing symptoms [**B**].

5.1 Why are investigations performed in pneumonia?

To confirm the diagnosis (microbiological if possible), assess severity, identify complications, detect co-morbidity and monitor progress.

5.2 What general investigations should be done in a child with suspected pneumonia in the community?

Key points

- Community management and assessment are based on clinical criteria.
- Pulse oximetry (where available) may help assess severity.
- Failure to progress at home or concern over clinical severity are indications for hospital assessment not further investigation.

5.3 Why are microbiological investigations performed in children with CAP?

To allow targeted antibiotic treatment and for epidemiological information.

5.4 What microbiological investigations should be done in children with suspected CAP in the community?

None routinely.

SECTION 6 SEVERITY ASSESSMENT

6.1 Importance of severity assessment

Severity of CAP can range from mild to life threatening. It is important to:

- identify severely ill children needing referral to hospital;
- avoid unnecessary admission.

The clinical indicators of severity are shown in table 2.

Key point

- Infants and children with mild to moderate respiratory symptoms can be managed safely at home. Those with signs of severe disease should be admitted to hospital [**D**].

Table 2 Clinical indicators of severity

	Mild	Severe
Infant	Temp <38.5°C RR<50/min Mild recession Taking full feeds	Temp >38.5°C Respiratory rate >70/min Moderate to severe recession Nasal flaring Cyanosis Intermittent apnoea Grunting respiration Not feeding
Older child	Temp <38.5°C Respiratory rate <50/min Mild breathlessness No vomiting	Temp >38.5°C Respiratory rate >50/min Severe difficulty breathing Nasal flaring Cyanosis Grunting respiration Signs of dehydration

When considering hospital referral, factors such as the presence of other illness or disability and the ability of carers need to be considered. Hospital admission may also be indicated if there is failure to improve by 48 hours or deterioration at any stage.

6.2 Indications for admission to hospital [C]

The indications for admission to hospital in infants and older children are shown in table 3.

SECTION 7 GENERAL MANAGEMENT (OTHER THAN ANTIBIOTICS)

7.1 In the community

The family needs help and advice on temperature control, simple analgesia, and fluid intake. Clear indications of when and how the family should seek further advice in the event of deterioration or failure to improve should be given.

Key point

- At home a child should be reviewed by the GP if s/he deteriorates or is not improving after 48 hours [**D**].

SECTION 8 ANTIBIOTIC MANAGEMENT

8.1 When to treat with antibiotics

Key point

- Young children presenting with mild symptoms of lower respiratory tract infection need not be treated with antibiotics [**B**].

8.2 Antibiotic treatment for home treated, non-severe CAP

Recommended and alternative treatments according to age are shown in table 4.

See also pharmacopoeia in Appendix.

SECTION 9 FAILURE TO IMPROVE: COMPLICATIONS

9.1 Factors to consider when a child with CAP fails to improve

- Is the child having appropriate drug treatment at appropriate doses?
- Is there a lung complication such as a collection of pleural fluid with the development of an empyema or lung abscess?
- Is there a complication associated with the patient's immune competence?
- Is there concomitant disease such as cystic fibrosis?
- Is compliance satisfactory?

Table 3 Indications for admission to hospital

Infants	Older children
SaO_2 <92%, cyanosis Respiratory rate >70/min Difficulty breathing Intermittent apnoea, grunting Not feeding Family not able to provide appropriate observation or supervision	SaO_2 <92%, cyanosis Respiratory rate >50/min Difficulty breathing Grunting Signs of dehydration Family not able to provide appropriate observation or supervision

Table 4 Antibiotic treatment for home treated, non-severe CAP

Age	Recommended	Alternative
<5 years	Amoxicillin	Co-amoxiclav or cefaclor
5 and older	Amoxicillin or erythromycin	Co-amoxiclav, cefaclor or clarithromycin (azithromycin)

Evidence of effectiveness [**B**].

SECTION 10 PREVENTION

Public health measures contribute to the prevention of community acquired pneumonia. Further work is needed to:

- reduce exposure to smoking;
- improve the uptake of routine vaccines against *Haemophilus influenzae* type b (Hib) and *Bordatella pertussis*;
- reduce overcrowding;
- improve housing.

The current influenza vaccine is not indicated in healthy children.

Appendix: Community acquired pneumonia pharmacopoeia for primary care

Drug	Age	Dose	Frequency (× daily)	Notes	Duration	Approx NHS cost price (exc VAT) per course†
Oral treatments:						
Amoxicillin	1 m–2 y	125 mg or 8 mg/kg	3	Dose may be doubled in severe infection	7–10 days*	£2.50
	2–12 y	125–250 mg or 8 mg/kg	3			
	12–18 y	500 mg	3			
Azithromycin						
	6 m–2 y	10 mg/kg	1		5 days	£13.50
	3–7 y	200 mg	1			
	8–11 y	300 mg	1			
	12–14 y	400 mg	1			
	⩾14 y	500 mg	1			
Cefaclor	⩽1 y	62.5 mg	3		7–10 days*	£12.00
	1–5 y	125 mg	3			
	6–12 y	250 mg	3			
	12–18 y	250 mg	3			
		375 mg (MR tablets)	2			
Clarithromycin	birth–1 y	7.5 mg/kg	2		7–10 days*	£17.00
	1–2 y	62.5 mg	2			
	3–6 y	125 mg/kg	2			
	7–9 y	187.5 mg	2			
	10–12 y	250 mg	2			
	12–18 y	250 mg	2			
Co-amoxiclav	birth–1 y	0.266 ml/kg (125/31 suspension)	3	Doses may be doubled in severe infections; Augmentin Duo is an alternative preparation given twice daily (see BNF)	7–10 days*	£9.00
	1–6 y	5 ml (125/31 suspension)	3			
	7–12 y	5 ml (250/62 suspension)	3			
	12–18 y	1 tablet (250/125)				
Erythromycin	birth–1 m	10–15 mg/kg	3	Doses may be doubled in severe infections	7–10 days*	£2.00
	1 m–2 y	125 mg	4			
	2–8 y	250 mg	4			
	9–18 y	500 mg	4			

*May need up to 14 days depending on clinical response. †For 10 year old patient of weight 30 kg (approx). Doses are based on information contained in the following texts: BNF No 38; Data Sheet Compendium 1998/99; Alder Hey Book of Children's Doses (1996); Guy's, St Thomas' and Lewisham Paediatric Formulary 4th Edition; Medicines for Children 1999. The age ranges used are those suggested by the British Paediatric Association and the Association of the British Pharmaceutical Industry. Information prepared by Paula Hayes MRPharms, RLC NHS Trust.