National Clinical Guideline Centre

Pneumonia

Diagnosis and management of community- and hospital-acquired pneumonia in adults

Clinical guideline <…>

Appendix A

June 2014

Draft for consultation

Commissioned by the National Institute for Health and Care Excellence

Disclaimer
Healthcare professionals are expected to take NICE clinical guidelines fully into account when exercising their clinical judgement. However, the guidance does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of each patient, in consultation with the patient and/or their guardian or carer.

Copyright
National Clinical Guideline Centre, 2014. Confidential.

Funding
National Institute for Health and Care Excellence

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

SCOPE

1 Guideline title

Pneumonia: diagnosis and management of community- and hospital-acquired pneumonia in adults

1.1 Short title

Pneumonia

2 The remit

The Department of Health has asked NICE: 'to develop a clinical guideline on pneumonia (including community-acquired pneumonia)'.

3 Clinical need for the guideline

3.1 Epidemiology

3.1.1 Pneumonia

a) Pneumonia is an infection of the lung tissue (as opposed to infections mainly affecting the bronchi such as bronchitis). The lung tissue is made up of thin-walled sacs that contain air. In pneumonia the air is replaced with microorganisms, fluid and inflammatory cells. Diagnosis of pneumonia in the community is usually made on the basis of symptoms and clinical signs. In hospital the diagnosis is made on the basis of new lung shadowing on a chest X-ray.

Community-acquired pneumonia

b) Community-acquired pneumonia (CAP) is defined as pneumonia that is acquired outside hospital.

c) CAP can be caused by several different bacteria and viruses. *Streptococcus pneumoniae* is the commonest cause of CAP.

d) The annual incidence of CAP is 500–1100 per 100,000 of the adult (aged 18 years and over) population. CAP is diagnosed in 5–12% of adults who present to GPs with

symptoms of lower respiratory tract infection, and 22–42% of these patients are admitted to hospital. The incidence of CAP and of hospital admissions for CAP varies with patient age and is higher in older people. Between 1.2 and 10% of adults admitted to hospital with CAP are managed in an intensive care unit.

e) In the UK, mortality in patients with CAP that is managed in the community is less than 1%. In patients admitted to hospital with CAP mortality is between 5.7 and 14%, and in those admitted to an intensive care unit mortality is over 30%. More than half (60%) of pneumonia deaths occur in people older than 84.

Hospital-acquired pneumonia

f) Hospital-acquired pneumonia (HAP) is defined as pneumonia that occurs 48 hours or more after hospital admission and is not incubating at hospital admission.

Early-onset (occurring within 4 days of admission) HAP is usually caused by the same bacteria and viruses as CAP and has a good prognosis. Late-onset (starting 5 days or more after admission) HAP has a worse prognosis and is usually caused by microorganisms that are acquired from the hospital environment. Pseudomonas aeruginosa, methicillin-resistant *Staphylococcus aureus* (MRSA) and other non-pseudomonal Gram-negative bacteria are the most common causes.

g) HAP is estimated to increase hospital stays by 7–9 days and has a mortality of between 30 and 70%. These figures include HAP that develops in patients in the intensive care unit who are intubated (have a tube inserted in their windpipe). This is known as ventilator-associated pneumonia and is clinically distinct from HAP in non-intubated patients. Ventilator-associated pneumonia has been studied more comprehensively than HAP.

1.1 Current practice

a) In a 2011 survey of 52,443 patients in 99 NHS trusts in England, the prevalence of hospital-associated pneumonia or lower respiratory tract infection was 1.5%. Of the 798 people who had hospital-associated pneumonia or lower respiratory tract infection, 642 (81%) had HAP and 65% of these cases were not associated with intubation. Pneumonia or lower respiratory tract infection were the most frequent types of healthcare-associated infection, accounting for 22.8% of cases.

b) Patients' experience of pneumonia varies depending on how severe their illness is. Some patients with CAP remain at home with minimal support from healthcare professionals. Others are admitted to hospital because their CAP is severe. All

patients with pneumonia experience some disruption to their daily and working life; however, most recover and return to their usual activities within a few days or weeks. For the most vulnerable patients (for example, older people and people with an underlying medical condition or weakened immune system) the complications associated with pneumonia may be more serious, with a longer recovery period and the possibility that their condition may be fatal.

c) People usually present to their GP for assessment, but some present to the community nursing team or directly to accident and emergency departments. GP practice varies. Pneumonia is suspected if there is history of cough and at least one other symptom of lower respiratory tract illness such as yellow-greenish mucus (sometimes blood-stained), fever, sweating, difficulty breathing or breathing faster than normal, aches and pains, loss of appetite or chest pains. New focal signs in the chest (such as crackles) and at least one systemic feature such as high temperature, shivers or sweating also point to a diagnosis of pneumonia, especially if there is no other explanation for the illness. The diagnosis may be suspected on the basis of clinical presentation alone, or may be confirmed by blood tests, microbiological investigations or a chest X-ray. Patients are usually treated at home with empiric oral antibiotics and antipyretics.

d) If the diagnosis is in doubt, the illness is of moderate or high severity, or there is inadequate response to treatment after 48 hours, the patient is referred for specialist assessment in hospital. A chest X-ray, oxygen assessment, blood tests and microbiological investigations are done to confirm the diagnosis and assess the severity of the illness. Treatment is with oral or intravenous antibiotics (depending on illness severity). Supportive therapy including oxygen, fluids, prophylaxis against venous thromboembolism, analgesia and nutritional support is often necessary.

e) In hospital, patients who are severely ill at presentation or whose illness fails to respond to initial management are referred to a specialist respiratory or intensive care physician for multidisciplinary assessment and, if needed, admission to an intensive care unit.

f) Patients who develop HAP are already in hospital for another reason or have been discharged from hospital recently. HAP can develop in patients being treated in any part of the hospital. It occurs more commonly in patients in the intensive care unit, those who have recently had major surgery and/or who have been in hospital for a long time.

g) The clinical features of HAP are the same as those of CAP. The diagnosis is confirmed by a chest X-ray. The clinical investigation and management steps in HAP are the same as in CAP. Whereas patients in hospital with CAP are usually managed by a physician, those with HAP are usually managed by the speciality responsible for their admission diagnosis.

h) Pneumonia represents a significant burden of illness for the patient and the NHS. The guideline will aim to determine evidence-based, cost-effective best practice to reduce mortality and morbidity from pneumonia and maximise resources.

4 The guideline

The guideline development process is described in detail on the NICE website (see section 6, 'Further information').

This scope defines what the guideline will (and will not) examine, and what the guideline developers will consider. The scope is based on the referral from the Department of Health.

The areas that will be addressed by the guideline are described in the following sections.

4.1 Population

4.1.1 Groups that will be covered

a) Adults (18 and older) with a suspected or confirmed diagnosis of CAP.

b) Adults with a suspected or confirmed diagnosis of HAP.

c) No patient subgroups have been identified as needing specific consideration.

4.1.2 Groups that will not be covered

a) People younger than 18 years.

b) Patients who acquire pneumonia while intubated (ventilator-associated pneumonia) and/or on the intensive care unit.

c) Patients who are immune-compromised (have a primary immune deficiency or secondary immune deficiency related to HIV infection, or drug or systemic disease-induced immunosuppression).

d) Patients in whom pneumonia is an expected terminal event.

e) Pneumonia complicating bronchiectasis.

4.2 *Healthcare setting*

a) Primary care settings, such as general practices, health centres and polyclinics.

b) Community care settings (including residential homes and nursing homes) where NHS healthcare is provided or commissioned.

c) Secondary care settings where NHS healthcare is provided or commissioned.

d) This guideline is commissioned for the NHS, but people providing healthcare in other settings, such as private settings, may find the recommendations relevant.

4.3 *Clinical management*

4.3.1 Key clinical issues that will be covered

a) Diagnostic investigations, including C-reactive protein and procalcitonin.

b) Microbiological investigations, including sputum and blood culture, and urinary antigens.

c) Severity assessment tools to guide referral, admission to hospital and admission to intensive care units.

d) Pharmacological interventions:

- antibiotic treatment:
  - when to start
  - which antibiotic or combination of antibiotics
  - duration
- glucocorticosteroid treatment.

Note that guideline recommendations will normally fall within licensed indications; exceptionally, and only if clearly supported by evidence, use outside a licensed indication may be recommended. The guideline will assume that prescribers will use a drug's summary of product characteristics to inform decisions made with individual patients.

e) Gas exchange management:

- continuous positive airway pressure
- non-invasive ventilation.

f) Monitoring response, including:

- C-reactive protein
- procalcitonin.

g) Criteria for safe discharge.

h) Patient information such as information on self-care and self-medication, condition-specific information, support and communication needs of patients (and carers and families as appropriate).

4.3.2 Clinical issues that will not be covered

a) Management of specific identified pathogens (including tuberculosis and viruses).

b) Pneumonia associated with clinically significant bronchiectasis, including cystic fibrosis.

c) Prevention strategies, including vaccination or lifestyle advice.

d) Management strategies:

- complementary and alternative treatments
- statins
- granulocyte-colony stimulating factor
- nebulised saline
- fluids
- nutrition
- physiotherapy
- palliative care.

e) Management of complications.

f) Follow-up after hospital discharge, including investigations.

4.4 Main outcomes

a) Mortality.

b) Hospital admission for CAP and number of days in hospital.

c) Adverse events.

d) Complications.

e) Health-related quality of life.

4.5 *Economic aspects*

Developers will take into account both clinical and cost effectiveness when making recommendations involving a choice between alternative interventions. A review of the economic evidence will be conducted and analyses will be carried out as appropriate. The preferred unit of effectiveness is the quality-adjusted life year (QALY), and the costs considered will usually be only from an NHS and personal social services (PSS) perspective. Further detail on the methods can be found in 'The guidelines manual' (see 'Further information').

4.6 *Status*

4.6.2 Scope

This is the final scope.

4.6.3 Timing

The development of the guideline recommendations will begin in November 2012.

5 Related NICE guidance

5.1 *Published guidance*

- Extracorporeal membrane carbon dioxide removal. NICE interventional procedure 428 (2012).
- Infection. NICE clinical guideline 139 (2012).
- Patient experience in adult NHS services. NICE clinical guideline 138 (2012).
- Healthcare-associated infections quality improvement guide. NICE advice (2011).
- Extracorporeal membrane oxygenation for severe acute respiratory failure in adults. NICE interventional procedure guidance 391 (2011).
- Medicines adherence. NICE clinical guideline 76 (2009).
- Respiratory tract infections – antibiotic prescribing. NICE clinical guideline 69 (2008).
- Technical patient safety solutions for ventilator associated pneumonia. NICE patient safety guidance 2 (2008).
- Feverish illness in children. NICE clinical guideline 47 (2007).

5.2 Guidance in development

NICE is currently developing the following related guidance (details available from the NICE website):

Drug allergy: the diagnosis and management of drug allergy in adults and children. NICE clinical guideline. Publication expected 2014.

6 Further information

Information on the guideline development process is provided in the following documents, available from the NICE website:

- How NICE clinical guidelines are developed: an overview for stakeholders the public and the NHS
- The guidelines manual.

Information on the progress of the guideline will also be available from the NICE website.