HOSPITAL-AQUIRED PNEUMONIA

RECOGNITION AND ASSESSMENT

Definition – Pneumonia at least 48hr after hospitalization, excluding any infection incubating at the time of admission

Symptoms

- Cough, dyspnoea
- Purulent sputum
- Pleuritic chest pain
- Fever, rigors
- Confusion

Signs

- Fever
- Tachycardia
- Tachypnoea
- Crackles
- Bronchial breathing
- Pleural effusion

Investigations

- Chest X-ray
- Arterial blood gases
- FBC, biochemical screen
- Sputum – inspection, microbiology, culture and sensitivity
- Blood cultures x 2 (by phlebotomists)
- Diagnostic pleural tap if patient has parapneumonic effusion (See Investigation of Pleural effusion guideline)
- Urine – legionella antigen
- Check whether patient positive for ESBL (extended-spectrum beta-lactamase producing Gram-negative bacilli), MRSA or MGNB (multi-resistant Gram-negative bacilli)

Differential diagnosis

- Congestive cardiac failure
- Pulmonary thromboembolism
- Drug reactions
- Pulmonary haemorrhage
- Adult respiratory distress syndrome

Immediate Treatment

- **If deteriorating contact ICU/outreach early**
- O_2 – check ABG to identify type 1 or type 2 respiratory failure (See Respiratory Failure Guideline)
- IV fluids – need to compensate for pyrexia and tachypnoea
- Analgesia for pleuritic chest pain
- Physiotherapy in patients with copious secretions
- **Antibiotic therapy** – see table below
    - Do not wait for microbiological confirmation
    - Initial treatment can be modified once results of sputum/blood cultures are known

Severe hospital acquired pneumonia - indicated by any of the following

- Respiratory failure ($Pa0_2$ <8kPa and/or $PaCO_2$ >6)
- Respiratory rate >25
- Rapid radiographic progression, multilobar pneumonia or cavitation.
- Hypotension – diastolic BP<60mmHg
- WBC low (<4 x 10^9/L) or very high (>20 x 10^9/L)
- Metabolic acidosis
- Poor urine output or rising creatinine

DISCUSS WITH SENIOR MEDICAL STAFF WHETHER TO REFER TO ITU

Antibiotics

- If renal impairment seek advice regarding dosage from pharmacy (5133)
- If microbe known follow advice of consultant microbiologist
- If IV route used initially change to oral when fever subsides and clinically stable
- 5-7 days treatment for uncomplicated pneumonia
- 2 weeks treatment for severe pneumonia, staphylococcal or legionella pneumonia
- Assume penicillin allergy only if convincing history of either rash within 72 hrs of dose or anaphylactic reaction. If any doubt whether patient truly allergic seek advice from a microbiologist.

Severity of illness	**First line**	**Alternative (penicillin allergy)**
Non severe	Co-amoxiclav 625 mg PO 8 hourly or 1.2 gram IV 8 hourly if unable to swallow	Meropenem 1 gram IV TDS Consult microbiologist if severe hypersensitivity to β-lactam antibiotics
Severe	Piperacillin-tazobactam (Tazocin) 4.5 gram IV TDS	Meropenem 1 gram IV TDS Consult microbiologist if severe hypersensitivity to β-lactam anitbiotics
Severe pneumonia and tagged for ESBL		
Check blood, sputum and urine cultures taken. Isolate in side room and inform infection control team (4282) and contact microbiologist (4666) for advice	Meropenem 1 gram IV TDS	Consult microbiologist if severe hypersensitivity to β-lactam antibiotics
If history of MRSA or MGNB (MRSA is common cause of ventilator associated pneumonia)	Discuss with Consultant Microbiologist	
If 'atypical' suspected e.g legionella	Add Clarithromycin 500mg IV BD into large proximal vein / 500mg PO BD	
Aspiration Pneumonia		
Non severe	Co-amoxiclav 625mg PO TDS/1.2 gram IV TDS	Doxycycline 100mg BD plus metronidazole 400mg PO TDS / 500mg IV TDS
Severe	Piperacillin-tazobactam (Tazocin) 4.5gram IV TDS	Meropenem 1 gram IV TDS Consult microbiologist if severe hypersensitivity to β-lactam antibiotics

MONITORING

- If hypoxic repeat ABG 1 hour after change of inspired O_2 then assess using pulse oximeter

- 4 hourly observations until stable
- Repeat biochemical screen every 24-48 hours while significant abnormalities exist

SUBSEQUENT MANAGEMENT

If no improvement consider following:

- Repeat CXR after 72 hours
    - ?complication – empyema, lung abscess (See Pleural Infection Guideline)
- Need for referral to respiratory physician
- Incorrect diagnosis

DISCHARGE POLICY

- **Follow up in clinic with a chest x-ray 6 weeks after discharge to ensure resolution of radiological changes**