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Friday, August 12, 2016

(Room 3)

16:30 - 17:25 WS #50: Topical Antiseptics & Managing Cough in Primary Care

17:35 - 18:30 WS #60: Topical Antiseptics & Managing Cough in Primary Care (Repeated)

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Acute cough

NZ South GP Meeting 12 August 2016

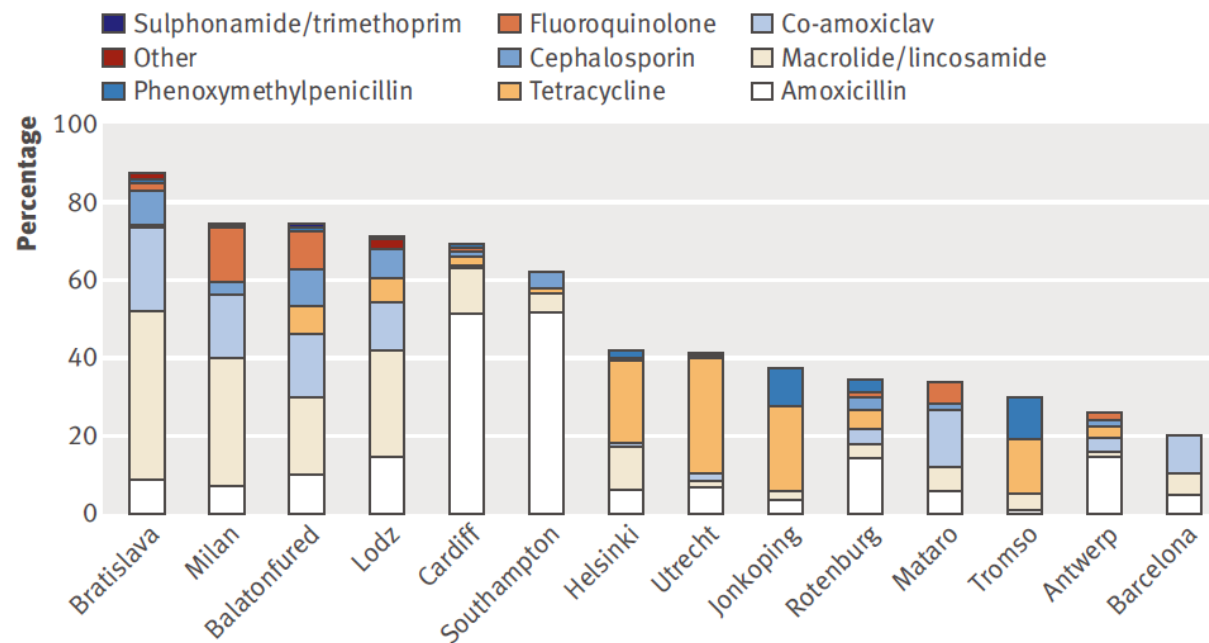
Acute cough

- = cough for less than 3 to 4 weeks



Use of antibiotics for acute cough

- **GRACE** – observational study
- 2800 patients with acute cough (< 4 weeks)
- Treated as per the local GP preferences



What causes acute cough?

- **GRACE** – microbial cause study
- 3102 patients with acute cough (< 4 weeks)
- (Oct 2007 to Apr 2010; 12 countries in Europe)
- Tests:
 - 65% submitted sputum; 70% was good quality
 - 99% had nasopharyngeal swab for PCR for respiratory viruses and 'atypical' bacteria
 - Serology for 'atypical' bacteria.

What causes acute cough?

- 77% infective cause detected
- Viruses 53%
 - rhinovirus (19.3%), influenza (9.8%), Coronavirus (6.8%), RSV (4.7%), hMPV (4.1%), parainfluenza virus (2.4%)
 - Seasonal
 - Repeat viral testing at 3 weeks → < 1% detected.
- Bacteria 23%
 - *Streptococcus pneumoniae* 9.1%
 - *Haemophilus influenzae* 14.9%
- Atypical bacteria < 1% (*Mycoplasma*, *Chlamydia*) – but between endemic years

What causes acute cough?

- **GRACE** – asthma and COPD study
- 2532 with acute cough - no known asthma or COPD
- All had spirometry after day 28
- Asthma = 13%
 - Defined as recurrent complaints of wheeze, cough and dyspnoea AND an increase in FEV₁ of $\geq 12\%$ or > 200 mL after bronchodilation.
- COPD 10%
 - Defined as FEV₁/FVC of < 0.7 or below lower limit of normal for age.

Summary so far

- Most acute cough is infective – viral > bacterial

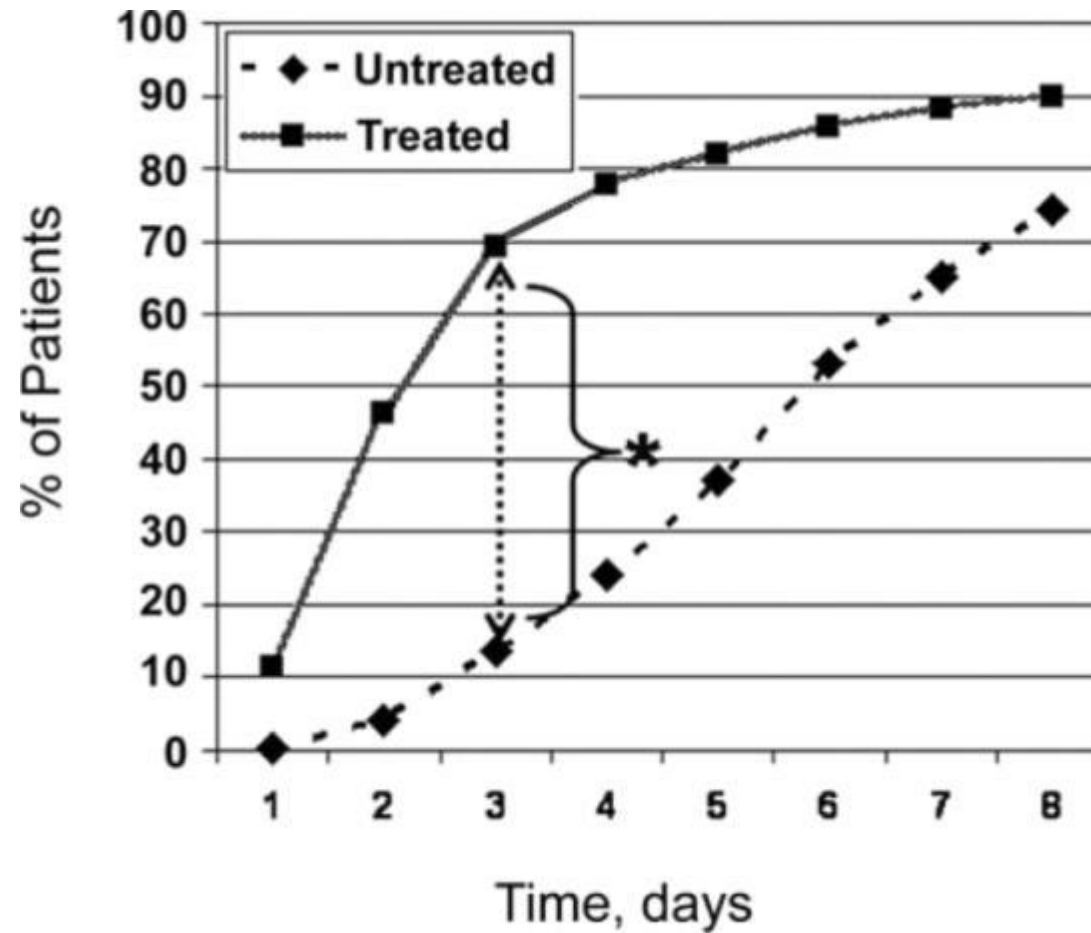
Which infections benefit from antibiotics?

Pneumonia benefits from AB

- One non-randomised but well-matched controlled study at the time of introduction of sulphonamides for lobar pneumonia
- Mortality
 - Sulpha antibiotic: 8%
 - No antibiotic: 27%

Evans GM, Gaisford WF. Treatment of pneumonia with 2-(p-aminobenzenesulphonamido)-pyridine. Lancet 1938;2:14-9

Time to pyrexia termination among patients with community-acquired pneumonia (n=550) who received sulfapyridine treatment (treated) or did not receive treatment (untreated) in South Africa, 1938. *Difference between groups is 55.6% (95% CI, 48.5%–62.7%).



Do antibiotics help bronchitis?

- 416 Spanish adults with 'uncomplicated bronchitis' = acute cough (< 7 days) plus discoloured sputum plus at least one other respiratory symptom (SOB, chest discomfort)
- 53% smokers or ex-smokers
- Augmentin vs ibuprofen vs placebo
- Outcome:
 - No difference in clinical features
 - GI side effects 12% vs 5% vs 3%

BMJ 2013; Oct4; 347: f5762

Do antibiotics help non-pneumonia LRTIs?

- **GRACE** – amoxicillin randomised trial
- 2061 patients with acute cough (< 4 weeks) and thought not to have pneumonia
- Randomised to amoxicillin 1g TDS or placebo
- 79% produced sputum, half discoloured
- 28% were aged 60+
- Documented symptom severity and duration

Lancet Infect Dis 2013; 13: 123

Do antibiotics help non-pneumonia LRTIs?

- Overall no reduction in severity or symptoms
- Subgroup analysis:
 - No benefit in first 4 days
 - No benefit at day 7 in those who were worse or no better
 - No benefit in elderly, co-morbidity, smokers, green sputum
 - Mild benefit if green sputum (NNT = 8 for symptoms) day 5 to 7
 - 6.7% ↓ symptoms at day 5-7 ($p = 0.094$)
 - Moderate benefit if consolidation on CXR
- Side effects:
 - Diarrhoea or nausea or rash 29% vs 24%

Lancet Infect Dis 2013; 13: 123

Antibiotics for acute bronchitis?

Cochrane review 2014

- 17 trials with 3936 participants
- Antibiotics
 - 1½ day fewer symptoms
 - 1 in 5 get side effects
- NSAIDs no benefit.

Cochrane Database Systemic Review 2014; 3: CD000245

Antibiotics for COPD flares?

Cochrane review 2012

- 16 RCTs with 2068 participants
- Failure rate at 7 to 28 days – effect of AB:
 - Outpatients (mild-mod) - RR 0.8 (95% CI: 0.63-1.01)
 - Inpatients (severe) - RR 0.77 (95% CI 0.65-0.91)
 - ICU - RR 0.19 (95% CI 0.08-0.45).
- Side effects:
 - Overall risk increased by antibiotics (OR 1.53)
 - Diarrhoea risk increased by antibiotics (OR 2.62).

Antibiotics for COPD flares?

Cochrane review 2012

"These inconsistent results call for research into clinical signs and biomarkers that help identify patients who benefit from antibiotics and patients who experience no effect, and in whom downsides of antibiotics (side effects, costs and multi-resistance) could be avoided"

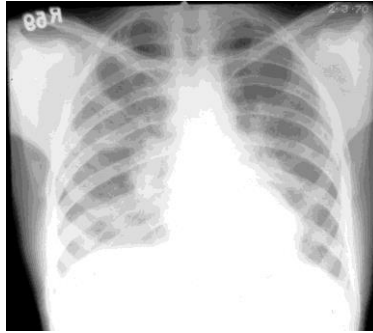
Do antibiotics help exacerbations of COPD?

- 53,900 patients admitted in the US with acute exacerbation of COPD (not critically ill or requiring ventilation)
- Antibiotics + steroid vs steroids alone
 - improved in-hospital mortality (1% versus 1.8%)
 - Improved readmission rate within 30 days (5.4% versus 6.8%)
 - Choice of AB made no difference to outcome. *Chest* 2013; 143: 82

Summary so far

- Most acute cough is infective – viral > bacterial
- Pneumonia benefits from antibiotics; non-pneumonia has minimal benefit and some harm

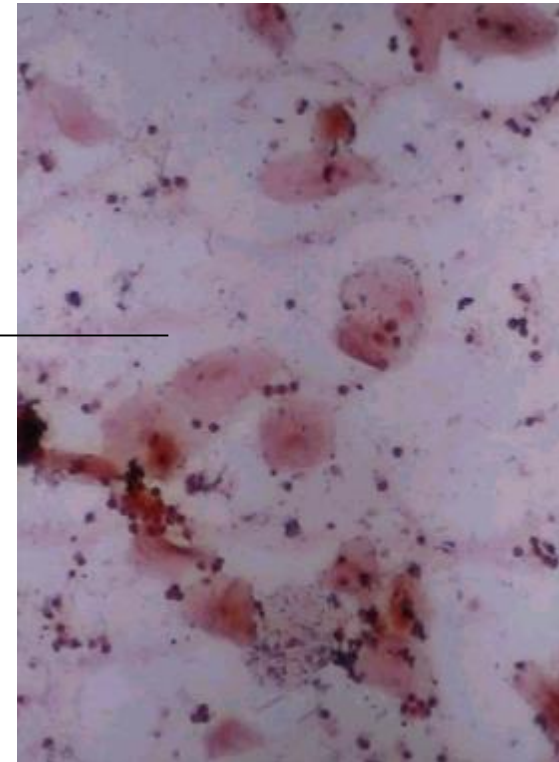
How to you identify pneumonia?



?

Sputum?

- Good sputum not available in 40-60%
- Sensitivity 35-74%
- Often contaminated
- Not recommended (ATS, BTS, IDSA) if mild pneumonia.



How many with acute cough in primary care have pneumonia?

- 2.4-20%

J Chronic Disease 1984; 37(3): 215-25

GRACE Study

Lancet 1993; 341(8844): 511-514.

Br J Gen Pract 2004; 54(498): 15-19

Diagn Microbiol Infect Dis 2002; 42(1): 21-28

J Fam Pract 2002; 51(4): 329-336

Scand J Infect Dis 1992; 24(5): 647-655

Clinical predictors of pneumonia

- 10-20 studies in adults, including > 4500 adults:
 - Absence of runny nose (2 studies)
 - RR > 25/min (4+ studies)
 - Fever (6+ studies)
 - Tachycardia (5+ studies)
 - Crackles (4+ studies)
 - Reduced breath sounds (3+ studies)
- Adults and older children:
 - Diarrhoea (2 studies)
- Children:
 - Fever (2 studies)
- Algorithms improve diagnostic accuracy.

Clinical predictors of pneumonia

- **GRACE** – predictors of pneumonia study
- 2820 adults attending GP with acute cough (< 4 weeks)
- 140 (5%) had pneumonia
- Independent predictors of pneumonia:
 - Absence of runny nose
 - Shortness of breath
 - Reduced breath sounds
 - Crackles
 - Tachycardia
 - Fever (>37.8 °C)
- A combination of the two strongest predictors (crackles and fever) had a PPV for pneumonia of 37%

BMJ 2013; 346:f2450

Clinical predictors of pneumonia

- Nine UK general practices, 256 pre-school children (mostly < 2 years)
- 'Complications' of acute cough in primary care
- Multi-variate analysis
 - Fever – OR 5.56
 - Chest signs – OR 2.88
- Positive-predictive value of predictors in study population
 - Overall 10%
 - Neither fever nor chest signs 6%
 - Chest signs 18%
 - Fever 28%
 - Fever and chest signs 40%

Brit J General Practice 2004; 54: 9-14

Clinical predictors of pneumonia

- 3981 children age < 16 y with acute symptoms
- 31 admitted to hospital with severe infection
- 32 predictors assessed
- Significant: fever, dyspnoea, diarrhoea, 'something is wrong'
- Dyspnoea + 'something is wrong'
 - Sensitivity for pneumonia 15/16
 - Positive predictive value for pneumonia 268/3950

Brit J Gen Pract 2007; 57: 538-46

C-reactive protein (CRP)

- A β -globulin synthesised by liver cells.
- Rises 4-8 hours after tissue damage and returns to normal several days after disease activity has ceased
- Elevated in a variety of inflammatory conditions – infections, cancer, trauma (including surgery) and connective tissue disease (RA, PMR, Crohns disease)
- The best bio-marker of bacterial infection (e.g. pneumonia) – better than WCC
- Correlates with severe pneumonia
- Common role in monitoring disease response.

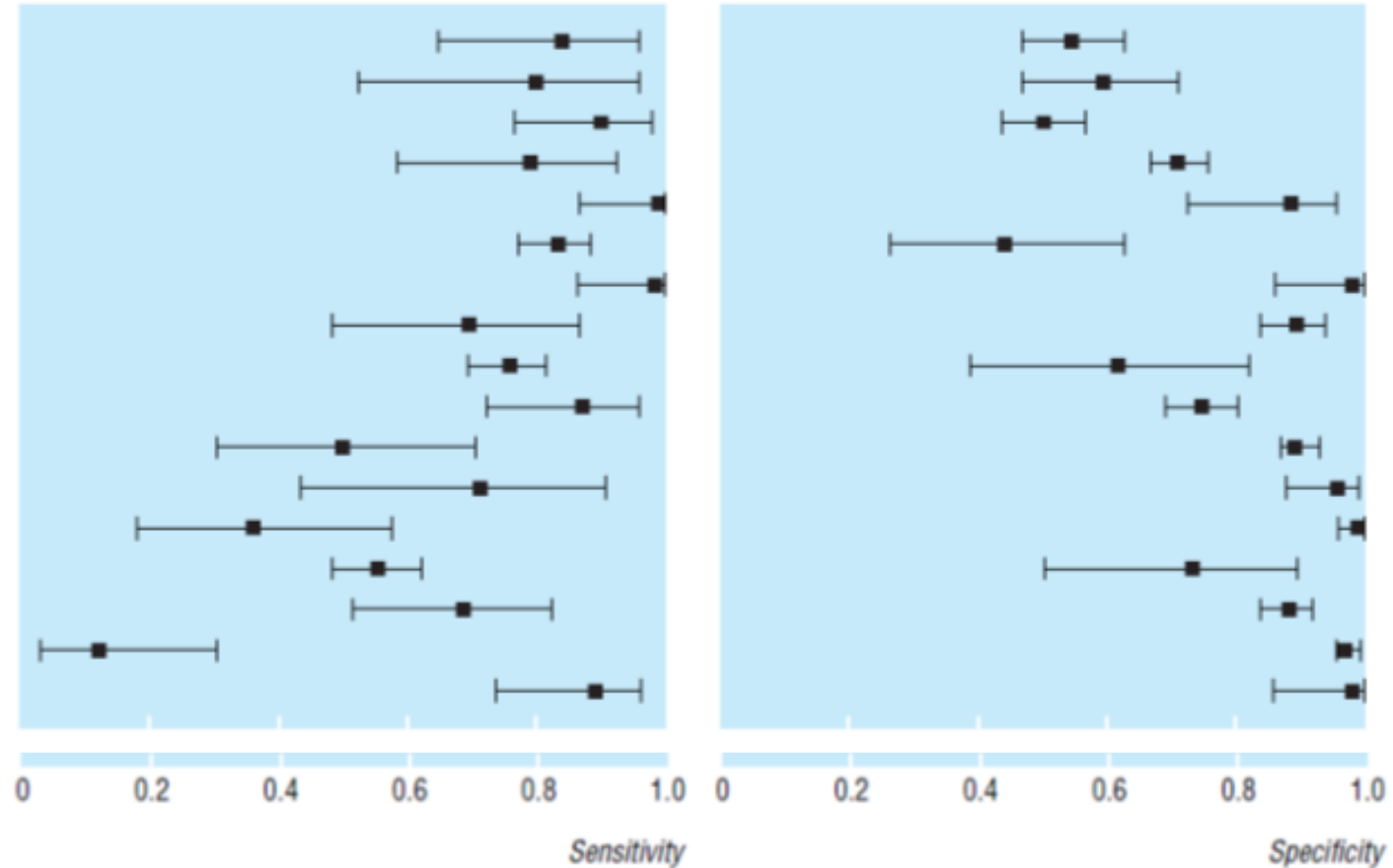
CRP and pneumonia

- 168 adults with acute cough (< 3 weeks) presenting to an ED and acute ambulatory care clinic in San Francisco
- Median CRP
 - Pneumonia (n=20) 60
 - Not pneumonia (n=148) 9
- Value of CRP ≥ 40 - sensitivity 70%
- CRP + reduced breath sounds + RR ≥ 24 /min had best accuracy as algorithm

Am J Med 2004; 116: 529-34

CRP and pneumonia

Flanders et al 2004 (CRP:11)¹⁷
 Melbye et al 1988 (CRP:11)⁴⁰
 Hopstaken et al 2004 (CRP:20)³⁷
 Melbye et al 1992 (CRP:20)³⁹
 Babu et al 1989 (CRP:20)³⁸
 Almirall et al 2004 (CRP:33)³⁴
 Babu et al 1989 (CRP:35)³⁸
 Flanders et al 2004 (CRP:40)¹⁷
 Almirall et al 2004 (CRP:50)³⁴
 Hopstaken et al 2003 (CRP:50)³⁷
 Melbye et al 1992 (CRP:50)³⁹
 Melbye et al 1988 (CRP:50)⁴⁰
 Flanders et al 2004 (CRP:100)¹⁷
 Almirall et al 2004 (CRP:100)³⁴
 Hopstaken et al 2003 (CRP:100)³⁷
 Melbye et al 1992 (CRP:100)³⁹
 Babu et al 1989 (CRP:100)³⁸



*Review of all published papers before 2005
 BMJ 2005; 331(7507): 26*

CRP and pneumonia

- 25 GPs in Netherlands; 246 patients with LRTI symptoms; all had CRP and CXR
- CRP strongly correlated with pneumonia
- Adding CRP > 20 to a clinical model would reduce AB prescribing by 41% with only 2.5% risk of missing pneumonia.

Brit J Gen Pract 2003; 53: 358-64

Predictors of pneumonia - GRACE

- **GRACE** – predictors of pneumonia study
- 2820 patients with acute cough (< 4 weeks)
- Predictors of pneumonia (5%):
 - Dyspnoea, no coryza , reduced breath sounds, crackles, pulse > 100 and fever > 37.8
 - CRP

BMJ 2013; 346:f2450

Predictors of pneumonia - GRACE

- GRACE-derived clinical + CRP algorithm applied to own study group (n=2820):
 - Low-risk group: 0.7% pneumonia
 - Intermediate-risk group: 3.8% pneumonia
 - High-risk group: 18.2% pneumonia
- Authors: Treat high-risk group only
- Commentators:
 - CXR in high-risk group?
 - CRP in intermediate clinical group only?

BMJ 2013; 346:f2450

Predictors of pneumonia - GRACE

- Algorithm might lead to:
 - 18% antibiotic prescription (compared with 20-85%)
 - A lot less unnecessary antibiotics
 - A few missed chances for beneficial antibiotics
 - (Patient reassurance/satisfaction)

BMJ 2013; 346:f2450

Summary so far

- We want to prescribe antibiotics for pneumonia (and severe/high-risk bronchitis?)
- Pneumonia :
 - Clinical predictors defined
 - CRP is a reasonable marker and adds value to clinical diagnostic algorithms
 - An algorithm including CRP can reduce antibiotic prescription with equal outcome.

Nelson-Marlborough Calculated Risk of Pneumonia Score

CRP-2 (Calculated Risk of Pneumonia) score*

Scope: adults presenting with acute cough – includes those with respiratory comorbidity (e.g., COPD, asthma).

History		Vital signs		Chest signs	
absence of runny nose	+1	fever ($> 37.8^{\circ}\text{C}$)	+2	crackles	+3
diarrhoea	+1	fast pulse ($>100/\text{minute}$)	+2	reduced breath sounds	+3
		rapid breathing rate	+2		

Add up the points to give a total score.

Score	Action
0-1	No antibiotic treatment or investigation
2	Provide patient information. Advise clinical review if new or worsening symptoms
3-4	Request CRP to help determine likelihood of pneumonia. If CRP >30 treat with antibiotics
5+	Treat with antibiotics

* Dixon/Everts 2014 Adapted from Br Med J 2013. 346:f24503

COUGH, PNEUMONIA & ANTIBIOTICS

WHAT CAUSES COUGHING?

Most coughs are caused by a virus infection. Some people have other causes of cough (like heart problems, medicine side-effects, or asthma) so it's important that your doctor checks you out for these. About 1 in 20 people who are coughing have pneumonia (a lung infection).

DO YOU HAVE PNEUMONIA?

A cough can be a sign of pneumonia but usually there are other symptoms to suggest this, such as a high temperature, shortness of breath, or fast pulse. Coughing for a long time or bringing up coloured sputum (spit) does not necessarily mean you have pneumonia. If you are feeling very unwell or you are worried about pneumonia, get checked out by your doctor.



Signs of pneumonia to watch out for:

- Shortness of breath
- Chills, sweats or fever
- Rapid breathing or racing pulse.

DO YOU NEED ANY TESTS?

Pneumonia can often be diagnosed by your symptoms and examination of your chest. If the doctor needs more information, he/she may request a blood test or occasionally a chest x-ray. A useful test is the CRP test (C-reactive protein) – the more CRP in your blood the more likely it is that you have pneumonia or another bacterial infection.

WHAT TREATMENT DO YOU NEED?

Most coughs are caused by a virus, which does not need any treatment other than simple medicines like paracetamol to make you feel

more comfortable. Antibiotics do not help a virus infection and may cause side effects or resistant bacteria in your body. If your doctor suspects pneumonia, you will be prescribed antibiotics.



Antibiotics help pneumonia, not other causes of cough

WHAT IF YOU ARE NOT GETTING BETTER?

It can take weeks for coughing to stop after a virus infection, so don't be concerned. If you are getting worse or getting new symptoms, however, tell your doctor. In particular, watch out for symptoms of pneumonia like shortness of breath, shivering chills, sweats or fever (you can measure your temperature with a thermometer), rapid breathing or racing pulse (get someone to count your breaths and measure your heartbeat). Other signs of a bad infection include coughing blood, new diarrhoea or vomiting, feeling confused or drowsy, feeling faint or getting a skin rash.

If you get any of these problems then go back to your doctor or follow the instructions you might have been given (your doctor may provide a blood test form or a prescription for antibiotics to pick up later).

PREVENTING THE SPREAD OF INFECTION

If you have a chest infection, stay away from other people until you are well. Cough or sneeze into your hands, your elbow or a tissue, then wash your hands or use an alcohol hand sanitizer.

If you are caring for someone with a chest infection, wash your hands or use hand sanitizer after you touch them to reduce the chance of catching the infection yourself.

Think about getting vaccinated against influenza each autumn, especially if you have other health conditions like asthma, heart disease or diabetes.

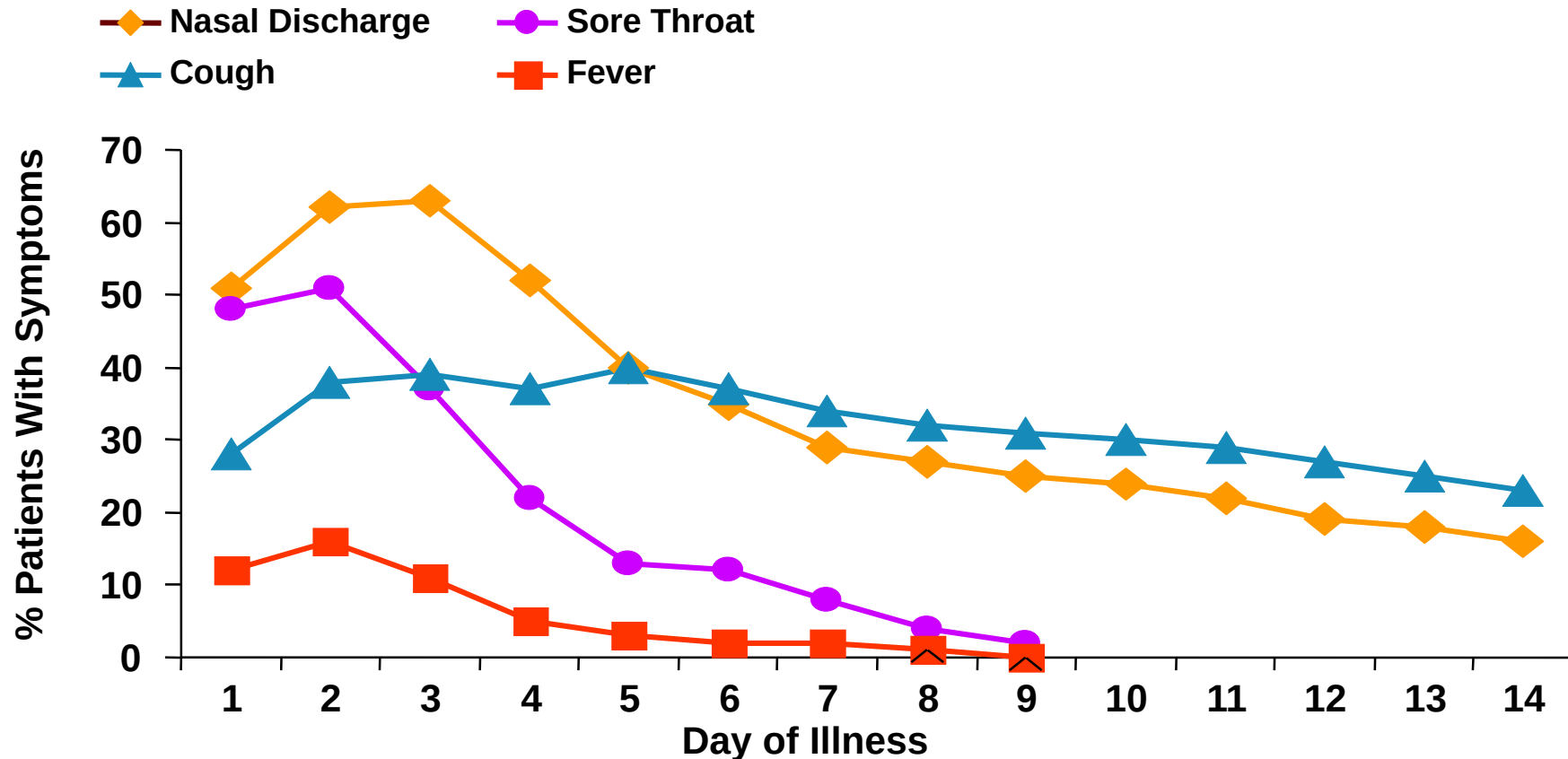


Kimi Hauora Wairau
Rangiorua Primary Health Organisation
Kimi Hauora Wairau | Rangiorua



Prepared by Richard Everts - April 2014

Duration of symptoms in Rhinovirus upper respiratory infections ('the common cold')



APBRS diagnosis may be made in a patient with a viral URTI that is not better after 10 days or worsens after 5–7 days and is accompanied by associated symptoms.

Adapted from Sinus and Allergy Health Partnership (SAHP). *Otolaryngol Head Neck Surg.* 2004;130(1 Suppl):1-45; Adapted from Gwaltney JM. *JAMA.* 1967;202:158-164.



A summary of prescribing recommendations from NICE guidance

Pneumonia

NICE CG191; 2014

This guideline covers the diagnosis and management of community- and hospital-acquired pneumonia in adults.

Definition of terms

CAP	community-acquired pneumonia
CRP	C-reactive protein
LRTI	lower respiratory tract infection

Assessment

Presentation in primary care

- For people with symptoms of LRTI, consider a point of care CRP test if after clinical assessment a diagnosis of pneumonia has not been made and it is not clear whether antibiotics should be prescribed.
- Use the results of the CRP test to guide antibiotic prescribing as follows:
 - Do NOT** routinely offer antibiotic therapy if the CRP concentration is <20mg/litre,
 - consider a delayed antibiotic prescription (a prescription for use at a later date if symptoms worsen) if the CRP concentration is between 20mg/litre and 100mg/litre,
 - offer antibiotic therapy if the CRP concentration is >100mg/litre.

intermediate or high risk of death using the **CURB65 score** (see box 1).

- Use clinical judgement in conjunction with the CURB65 score to guide management, as follows:
 - score of 0 or 1: consider home-based care,
 - score ≥ 2 : consider hospital-based care,
 - score ≥ 3 : consider intensive care assessment.
- Stratify patients presenting with CAP into those with low-, moderate- or high-severity disease. The grade of severity will usually correspond to the risk of death.
- Consider measuring a baseline CRP concentration in patients with CAP on admission to hospital, and repeat the test if clinical progress is uncertain after 48 to 72 hours.

Microbiological tests

- Do NOT** routinely offer microbiological tests to patients with low-severity CAP.
- For patients with moderate- or high-severity CAP:
 - take blood and sputum cultures and consider pneumococcal and legionella urinary antigen tests.

Pharmacological treatment

Antibiotic therapy

- Offer antibiotic therapy as soon as possible after

What to do if still coughing?

- Duration of symptoms has no correlation with likelihood of pneumonia in GRACE study or any other acute cough study

BMJ 2013; 346:f2450

What to do if still coughing?

- Go back to GP?
 - Repeat CRP?
 - Back-pocket prescription?
 - GPs, Community Pharmacists and patients educated about when to get antibiotics.
- 

WHAT IF YOU ARE NOT GETTING BETTER?

It can take weeks for coughing to stop after a virus infection, so don't be concerned. If you are getting worse or getting new symptoms, however, tell your doctor. In particular, watch out for symptoms of pneumonia like shortness of breath, shivering chills, sweats or fever (you can measure your temperature with a thermometer), rapid breathing or racing pulse (get someone to count your breaths and measure your heartbeat). Other signs of a bad infection include coughing blood, new diarrhoea or vomiting, feeling confused or drowsy, feeling faint or getting a skin rash.

If you get any of these problems then go back to your doctor or follow the instructions you might have been given (your doctor may provide a blood test form or a prescription for antibiotics to pick up later).

Back-pocket prescriptions

- Patients like back-pocket prescriptions

Br J Gen Pract 2003; 53(486): 36–41

- NICE LRTI in primary care guideline 2008 recommends delayed prescription
- Delayed prescriptions have good features:
 - Understanding the patient's perspective - 'I acknowledge you are ill'
 - Positive consultation - 'I am sure you will get better without antibiotics'
 - Involving patient in management plan – 'If I am wrong you can be in charge of if and when you collect the script...'

How did it work in Nelson, 2014?

- Positive feedback from GPs: 'empowering'
- 21% increase in CRP test use
- A reduction in all May to October respiratory antibiotic prescribing for adults > 16y:
 - Amoxicillin – 309 (4.6%) fewer
 - Macrolides – 470 (12.4%) fewer
 - Doxycycline – 98 (4.7%) fewer
- No significant change in hospital admissions for chest infection.

Sensitivity of CRP-2 in Nelson

- 208 admissions to Nelson Hospital with pneumonia, April to December 2014
- Reviewed n=56
- 34 saw GP or MIC before admission
- Predictors of pneumonia (when documented):
 - Absence of runny nose: 67% Diarrhoea: 21%
 - Fever: 53% Pulse > 100: 32% RR > 25: 67%
 - Crackles: 72% Reduced breath sounds: 32%

Sensitivity of CRP test in Nelson

C-reactive protein	# of cases
<10	3
10 to 20	2
21 to 30	2
31 to 40	2
41 to 50	2
51 to 60	4
61 to 70	4
71 to 100	6
101 to 150	8
151 to 200	8
201 to 300	10
> 300	5

CRP < 20, 3 of 5
repeated:

- 2 rose to > 60
- 1 remained < 20

Sensitivity of CRP-2 in Nelson

CRP-2 score	# of cases
0	1
1	1
2	2
3	3
4	0
5	11
6	9
7	6
8	5
9	8
> 10	4

Acute cough algorithm?

■ Pros

- Evidence-based
- Goals are admirable
- Concept of algorithm/score is common
- CRP testing useful in other infections, POCT in future – patients like it.

■ Cons

- Evidence weak in places (e.g., diarrhoea)
- Not sure if it will work locally
- CRP testing a hassle
- Does not include children.

Case #1

- 51 year male
- Past history asthma, hayfever, CABG
- History
 - 6 days sore throat, now gone
 - 4 days blocked runny nose, mild cheek pressure and dry cough
 - 1 day cough ++, wheeze
 - No sputum, shortness of breath, fever, chest pain.

Case #1

■ Examination

- Pulse 72/min
- BP 135/95 mmHg
- RR 16/min
- Temp 36.5 °C
- Chest – wheezy+, no dullness, reduced breath sounds or crackles.

Nelson-Marlborough Calculated Risk of Pneumonia Score

CRP-2 (Calculated Risk of Pneumonia) score*

Scope: adults presenting with acute cough – includes those with respiratory comorbidity (e.g., COPD, asthma).

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* Dixon/Everts 2014 Adapted from Br Med J 2013. 346:f24503

Case #1

- Impression:
 - Algorithm: clinical score = 0 → no CRP, no AB
 - Viral exacerbation of asthma.

Quantitative Crp (Cumulative)

Results			
Test Description	1	Units	Ref. Range
Order Number	<u>14-9296892-CRP-0</u>		
DateTimeCollected	12-Mar 2014 10:57		
☐ CRP	4	mg/L	< 5

Case #2

- 82 year male
- History
 - 1 week cough, with thick green phlegm
 - Low energy
 - No upper respiratory tract symptoms
 - 2 days hiccups
 - Feels like he has a high temperature at times
 - No shortness of breath.

Case #2

■ Examination

- Pulse 83/min
- BP 110/70 mmHg
- RR 16/min
- SaO₂ 98% room air
- Temp 36.3 and 37.4 °C
- Chest – crackles at right base

Nelson-Marlborough Calculated Risk of Pneumonia Score

CRP-2 (Calculated Risk of Pneumonia) score*

Scope: adults presenting with acute cough – includes those with respiratory comorbidity (e.g., COPD, asthma).

History		Vital signs		Chest signs	
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Case #2

- Impression:
 - Possible pneumonia
 - Algorithm: clinical score = 4 → CRP
- CRP = 88 → given antibiotics
- Follow up:
 - Loss of appetite, mild confusion, fall → admitted to NPH with tachycardia, hypotension
 - CXR = RLL pneumonia
 - CRP rose to 132 – then fell with treatment.

Choice of AB for mild pneumonia

- Multiple options, numerous guidelines, few data on comparative efficacy.
- BPAC 2013
 - Adult: amoxicillin; roxithromycin or doxycycline
 - Child: amoxicillin; macrolide
- Australian Therapeutic Guidelines 2014
 - Adult: amoxicillin or doxycycline
 - Child: amoxicillin or macrolide

Which macrolide?

	Azithromycin	Roxithromycin	Erythromycin
Absorption	OK	OK	OK
Tissue/serum concentration	10-100x (sputum, lung, alveolar macrophages)	1-5x	1x
Half life	15-40 hours (tissue 2 to 4 days)	10-12 hours	2 hours
Dosing	Daily for 3 days	Daily for 7 days	2-4 times daily
Indigestion	8%	5%	16-20%
QT prolong /arrhythmia	Mild	Mild+	Worst
Pregnancy	Probably safe	Probably safe	Safe
Interactions	Few	Few	Many
Cost per course	\$2.00	\$2.09	\$4.75

Duration of antibiotics

- Five RCTs show that 5 days is as effective as longer durations
- One RCT showed that if well at 3 days then can stop
- BPAC 2013: 5 to 7 days
- Don't stop at 5 days if empyema, abscess, legionella, mycoplasma or *Staphylococcus aureus* infection.

Antibiotics for acute cough

- Outcome same by region or antibiotic choice

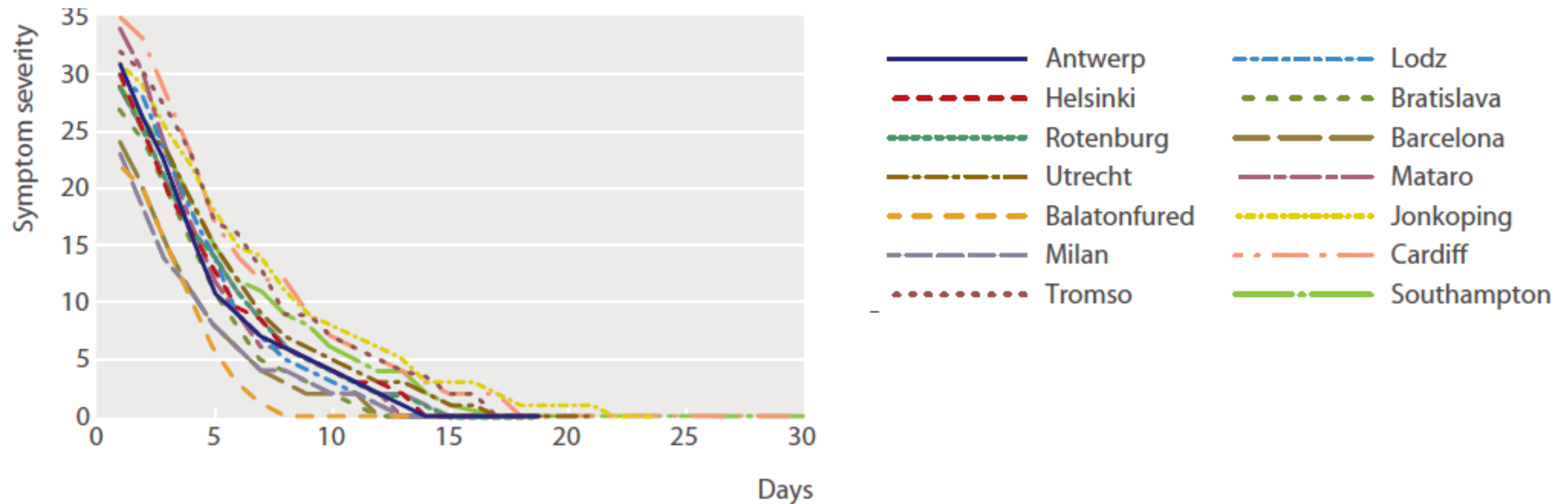


Fig 4 | Unadjusted median symptom severity scores over time by network

Symptom-based duration

- Small RCT in primary care, Nelson, 2015-16
- Uncomplicated, moderate, community-acquired urine, skin, lung and sinus infections in adults.

	Standard duration (n = 31)	Symptom-based duration (n = 35)
Days of antibiotic treatment (mean (SD))	5.1 (1.7)	4.3 (1.9) $p=0.057$
Defined daily dose (mean (SD))	7.4 (5.6)	5.4 (5.1) $p=0.13$
Treatment-emergent adverse events (TEAE)	7 (23%, none severe)	6 (17%, none severe) ^{NS}
Immediately needed more antibiotic at end of treatment	1 (3%)	- ^{NS}
Relapse within 3 weeks of completing treatment	2 (6%)	2 (6%) ^{NS}

Unpublished as yet

The need for hospitalisation

- Useful risk factors for increased mortality and therefore consider admission:
 - Age > 65 years
 - Confusion
 - RR > 30/min
 - Systolic BP < 90 mmHg

BPAC 2013

Prevention of pneumonia

- Reducing transmission of viruses and bacteria
 - Avoiding people with respiratory infections
 - Hand hygiene
 - Cough etiquette and masks
- Vaccination
- Swallowing problems
- Smoking cessation
- ACEi – ↓ risk by 27-34% BMJ 2012; Jul 11; 345: e4447

Vaccination

- Potential benefit – pertussis, Hib, measles, VZV
- Influenza
 - ↓ pneumonia incidence by 53%

Ann Int Med 1995 123(7): 518–27

- Pneumococcus
 - Children and healthy adults – ↓ all invasive disease
 - Elderly – ↓ bacteraemia, unclear re pneumonia
 - Chronic lung disease - ↓ admission for pneumonia
 - HIV-positive - ↓ pneumonia
 - Funded for limited high-risk patients; recommended for many others (> 65y, chronic disease, immunocompromise)

Cough Rx – not antibiotics

- Think about other causes
- Mucosal damage → self-perpetuation
- Cochrane review 2014 of OTC Rx for acute cough in adults in the community:
 - 'no good evidence for or against the effectiveness of OTC medicines in acute cough.'
 - Some data for honey in children, opioids in adults (codeine, dextromethorphan and pholcodine.)
- OTC cough relief and other positive specific recommendations, sympathy, reassurance = improve patient satisfaction.

Take home points

- Acute cough in adults
 - $\approx 5\%$ is pneumonia; ≈ 1 in 5 should get antibiotics
- Pointers to need for antibiotics
 - Weak: absence of runny nose, diarrhoea
 - Stronger: fever, fast pulse, rapid breathing, crackles, reduces breath sounds, CRP
- Educate the 4 in 5 who don't get antibiotics
 - If key symptoms $\rightarrow$ return to GP, re-test CRP or use back-pocket prescription.



Nelson-Marlborough Calculated Risk of Pneumonia Score

CRP-2 (Calculated Risk of Pneumonia) score*

Scope: adults presenting with acute cough – includes those with respiratory comorbidity (e.g., COPD, asthma).

History	Vital signs	Chest signs
absence of runny nose +1	fever ($> 37.8^{\circ}\text{C}$) +2	crackles +3
diarrhoea +1	fast pulse ($> 100/\text{minute}$) +2	reduced breath sounds +3
	rapid breathing rate +2	

Add up the points to give a total score.

Score	Action
0-1	No antibiotic treatment or investigation
2	Provide patient information. Advise clinical review if new or worsening symptoms
3-4	Request CRP to help determine likelihood of pneumonia. if CRP > 30 treat with antibiotics
5+	Treat with antibiotics

* Dixon/Everts 2014 Adapted from Br Med J 2013; 346:f24503

Thank you
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